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THE RIGHT HONOURABLE LORD LAWRENCE, G.C.B., G.C.S.I.,
in the Chair.

ON JOURNEYS BETWEEN HERAT AND KHIVA.

By Major-General SIR FREDERIC J. GOLDSMID, C.B., K.C.S.I.

THE late Lord Strangford, in an interesting and elaborate paper on Vambéry's Travels in Central Asia, contributed nearly ten years ago to the *Quarterly Review*, brings prominently to notice the fact that Independent Turkistan, or the region of the three Khanates of Khokand, Bokhara, and Khiva, was only practically accessible to the non-accredited traveller from Western Europe, on the southern side. Referring to the approach from that quarter, he states that of the Afghan routes the principal is that of Herat, converging with the Persian route from Mashhad at Marv. I propose to consider the information we find readily available on this important section of the Central Asian Map; not because it involves any very new features of political or physical geography, but because it seems to have been more or less ignored in the last two years' discussions arising from an unusually direct, and, moreover, a somewhat remarkable move of Russian diplomacy.

The journeys of Abbott and Shakespeare naturally present themselves as affording the latest and most reliable data for the purpose just stated. When they were undertaken, the politics of Central Asia had suddenly become of the deepest interest to those Englishmen who understood them; of passing perplexity to those who, without full comprehension of their import, were responsible for the course pursued by this country in regard to them; but were, upon the whole, rather *caviare* than strictly congenial to the taste of the general public.

In these days, although the interest aroused at home in Central Asia

falls far short of the great importance of the theme, and seems really to owe its sustentation at all to startling telegrams, a sensational article or volume, a speech in or out of Parliament, or a Shah's visit, there is certainly no lack of materials stored together in our libraries and Institutions to ground, as well as to coach a tyro into a respectable Oriental diplomatist; and to this common stock were there but added the contents of official shelves and official map-rooms, I believe that England could now show the world as much true and trustworthy information on the political and physical geography of the Khanates and Chinese Turkistan, as well as on Persia, Afghanistan, and Baluchistan, as is possessed by any nation in the world, not excepting Russia. Were it worth while, as it may some day be thought, for Government to organise a separate department of men and *matériel* for the conduct and development of its Asiatic relations, exclusive of British India and British Colonial possessions, but inclusive of Turkey, Arabia, and Persia, perhaps also of China and Japan, we might have a school of administrators and executives, if not superior to all existing continental establishments, at least not inferior to any. That a consummation so devoutly to be wished, can be attained without the pains and expense of separate organisation, or without borrowing an idea from contemporary foreign practice, is to me problematical. But we may take a hint from our neighbours without servile imitation; and improvement and modification may be freely exercised on the models with which they supply us.

A quarter of a century ago, about the period to which I have already reverted, able politicians and excellent explorers were to be found in the Indian services: men ready to devote their lives to the State with a loyalty worthy of more consideration than measured out by bare results in the form of success or failure. Alexander Burnes, Arthur Conolly, Leech, Lord, and Oxus Wood were types of the class; one, whose members, though not all professional soldiers, were, without exception, actuated by a soldierly spirit. Travellers of this stamp, making light of the barriers of the Hindu Kush and its offshoots, eagerly emerged upon a new scene, and strong in civilized energy and ambition, descended upon the little-explored regions before them to gather to their country's honour as their own, rich fruits of interesting knowledge for the benefit of coming, as of present generations. In the years 1839-40, this irruption of enterprising emissaries from India reached its climax; and it can hardly be supposed that the great Power overhanging the Central Asian belt on the North could remain passively contemplating the action of a rival European Power, which, having under Providence become possessed of an Empire in the far East, was utilizing the resources of that distant possession, after so practical a fashion, close to its own doors. Hence must be attributed the counter-movement which, though it may not be said to have caused, may be fairly held to have hastened the past annexation of land, and more thorough absorption of power in the no longer Independent Khanates. So rapid has been progress in this direction that Khiva and Bokhara have already suffered territorial confiscation, and Khokand is clenched as in a vice. Our explorers have now not far to go

beyond the limits of the Hindu Kush, to find themselves on Russian soil. It is not our business in this place to inquire into the advantages or disadvantages of a state of things not by any means abnormal, nor contrary to the precedents of Time and natural development. We have to congratulate ourselves on at least one mission during the past year, which has broken ground in a most interesting quarter, and brought home information on the political and physical geography of Eastern Turkistan and the Pamir Steppe or valleys, as well as other scientific results of well-conducted research. And if we have no recent similar missions to credit to England over the regions lying between the Tian-Shan mountains and the Caspian, we may find consolation in the fact that a British Officer has been permitted to accompany the Russian Expedition, which in the past summer commenced exploring the mouths of the Oxus with a view of perfecting as much as possible the water communication so essential to the security of Russian interests in Turkistan. Major Herbert Wood is working under different conditions from those which influenced his eminent namesake, Lieutenant John Wood of the Indian Navy; but there is no reason why good utilitarian service should not be rendered at the outlet as at the source of the ancient river.

Missions of Abbott and Shakespeare, 1840.—Before entering upon the practical business of the present paper, I will say a few words on the Officers whose routes we are about to retrace. Missions to Persia and the neighbouring tracts are not sufficiently popular to be well known and understood in England on their merits alone. They require the newspaper paragraph, the publisher's advertisement, and last not least the temper and character of the times to support them; for without such significant aid they are weighed and judged within the official world which is their birth place; and beyond the circle of that world they have no real existence. In the case referred to, the publisher has not been wanting, but interest in the theme treated, has flickered and failed, and its revival has been at an hour when later journeys and incidents are in demand. If I endeavour to deal with the matter briefly, it is simply because my explanation must be of the nature of a preface.

Major-General James Abbott, C.B.—Captain James Abbott of the Bengal Artillery was at Herat in 1839, when Major D'Arcy Todd, of the same corps, had entered upon the duties of Envoy at that important place, in the face of difficulties compared to which the settlement of an Alabama question would be clover and child's play. Among other proceedings due to the circumstances of the day, the latter Officer managed to open communications with the Khan of Khiva, who responded to the friendly messages of the British by despatching an Ambassador from himself to the Indian Government. As might have been anticipated, the demands of the Kharizmians were more than could be complied with; but in place of a disappointing letter, Captain Abbott was deputed to visit their capital in person. At Khiva there was considerable commotion, for it was the period when

General Perovsky, with a large force, was endeavouring to invade the Khan's territory from Orenburg and Fort Emba, by a route west of the Aral Sea. The reasons for entering upon a campaign of so physically difficult and so morally disturbing a nature have long been made public. Insufficient compensation for the capture and enslavement of Russian prisoners by Turkmans had been obtained in the counter-capture of Khivan subjects; and a succession of unsatisfactory missions and minor expeditions had finally culminated in the formation of a somewhat formidable Russian Army of invasion. After a long detention and several interviews with his royal but uncivilised entertainer, Abbott was induced to proceed, on the potentate's behalf, in the direction of the advancing Northern foe; but on reaching the shores of the Caspian, he was attacked, plundered, and otherwise ill-treated by Kazaks or Kirgiz, narrowly escaping with his life and losing two of his fingers. Those who have not read the narrative of a "Journey from Herat to Khiva, Moscow, and St. Petersburg," will do well to procure the book and trace in it the adventures of this gallant Officer through months of peril and anxiety.

The late Colonel Sir Richmond Shakespeare.—An account of Lieutenant Shakespeare's journey is to be found in "Blackwood's Magazine" for June, 1842, in which month the writer was fulfilling the duties of Military Secretary to Sir George Pollock, who had halted with his Army at Jalálabad, on the high road to Kabul. This same Officer, also an artilleryman, was chosen, it will be remembered, on the occasion of the British advance into Afghanistan in 1839, to accompany Major D'Arcy Todd when detached to Herat on political employ. From Herat he was dispatched to Khiva in 1840—some five months after Captain Abbott's departure in the same direction—to complete the negotiations which his brother Officer and immediate predecessor had commenced for the release of Russian captives, and his efforts in the cause were so far successful that he was enabled to escort a large body of these men to their native country. Whether or no the collection and registration of the party by the Russian Cornet Aitoff, also a prisoner in the Khan's hands, be taken into account in estimating the share of merit to be accorded to each actor in the drama, our verdict must be passed on the actual duty intrusted to the British Officer, and the mode of its fulfilment; and we can surely affirm that the political utility of the proceeding was no more conspicuous than its practical philanthropy. It is not easy for all practised travellers, much less for worthy citizens of London who seldom quit their own firesides, to appreciate fitly the service rendered by a fellow-countryman in escorting 416 human beings of exceptional type from Khiva to Novo Alexandrovsk, across the Ust Urt; but it was a feat well worthy of record. On the 1st October he handed over his charge to the Russian Governor at Orenburg; at St. Petersburg, in November, he received the personal thanks of the Emperor for his labours; and he soon afterwards reached England, to return to India in 1841 with a well-earned knighthood.

As regards Sir Richmond Shakespeare's after career, I will quote a

passage from a remarkable article by Mr. Henry Lushington, reprinted some 30 years ago, with other papers, in a small octavo volume, under the title of "A Great Country's Little Wars." The author is treating of the relief of the British captives on the re-occupation of Cabul:—

"The principal immediate agent in their recovery was, appropriately, the same English Officer whose name was previously known as connected with a service to humanity more free from alloy, more purely gratifying, than it can have often fallen to the lot of a military man to effect—the rescue and safe conduct to St. Petersburg of the prisoners detained at Khiva. Sir Richmond Shakespeare, to whose lot two such services have fallen, is indeed a man to be envied."

Sir Vincent Eyre also speaking of that memorable month of September, 1842, says:—

"On the 17th we were reinforced by Sir R. Shakespeare, who had ridden out from Kabul with 600 Kizilbash horsemen, to our assistance. His aid was most timely; for Sultan Muhammad Khan, with 1,000 men, was hastening to intercept us."

General Perovsky's narrative, written many years after these missions had been accomplished, while ignoring aught but political objects in the whole proceeding, confirms at least the arduous and adventurous character of the duties undertaken:—

"The English Agents," he states, "who were in central Asia during the years 1839 and 1840, were Abbott and Shakespeare. In May, 1840, Captain Abbott, of the East India Company's service, reached Novo-Alexandrovsk Fortress from Khiva, and proceeded thence to Orenburg. * * * By the order of the Khan he was robbed and wounded on his route to the Caspian by a gang of Turkmans (who had even been instructed by the Khivans to kill him), and from Orenburg he was sent in a suitable manner to Petersburg, whilst the Afghans that had accompanied him were sent back to their native country. Shakespeare, the other English Officer, reached Orenburg, *viâ* Novo Alexandrovsk, with the Russian prisoners who had been released from Khiva; he was immediately sent on to St. Petersburg."

Oxus Route.—If we take routes actually traversed, with deviations and *détours*, the distance from Herat to Khiva, by the Oxus, may be reckoned roughly at a maximum of 700 miles. Of this route, the two *termini* and the intervening station of Marv, about 430 miles from Khiva, are really the only places which demand especial notice among centres of population. As the crow flies, the whole distance is less than 600,¹ or, according to one estimate,² little more than 500 miles; and Marv is nearly midway. Indeed, some modern geographers attribute the commercial importance of Marv to the circumstance that it "lies almost in the centre of a region bounded by five large markets, Khiva, Urganj, Bukhâra, Balkh, and Herat, being 180 to 280 miles distant from each" (Ritter). Mashhad, the capital of Russian Khurasan,

¹ Abbott makes it less by his own route.

² Markham. History of Persia. Appendix D.

might have been added on the S.W. as an important city within the specified limits.

Herat.—Herat has been often described. In reverting to it we need not go back to the classical period, or even to the Arabic and Persian geographers, though materials are ample in both respects. During the present century Christie is its earliest English visitor; but Forster preceded him by 27 years, or in 1783. Arthur Conolly, a hero in life as a martyr in death, was there in 1830. His Persian attire did not divest him of his English personality, and his name and nationality were known to Shah Kamrán. From Eldred Pottinger's arrival there in 1837, until Todd's departure in 1841, it was the open abode, as well as halting-place, of many British Officers. After the latter year, less direct and trustworthy information on the locality has been at the disposal of Her Majesty's Government, if we except that obtained by Colonel Taylor's mission in 1857, and by Colonel (now Sir Lewis) Pelly in 1860. But Ferrier, travelling in 1845, Khanikoff in 1858, and Vambéry in 1863, have published most interesting particulars of this much extolled city, its inhabitants, and surroundings; and to these writers the general public is greatly indebted for the readiness and ability with which they have utilized their labours in print. From the sources named, there is no difficulty in depicting the "Heri" of the present day within the bounds necessary to be observed in an ordinary lecture.

The word "*júlghah*" is commonly applied in the East of Persia to the large tracts of low level ground in a hilly country, lying between long ranges, parts of one mountain system. These, being rather plains than valleys, riverless, but watered from the overhanging mountains, are in some cases fairly fertile; in others partially so; in others almost desert. The large district of *Káian*, on the *Káianát*, S.W. of the *Siah-kuh* range, through which I passed when returning from *Sistan* in 1872, affords a full illustration of my meaning. Now, the valley in which Herat is situated, inclusive of the surrounding plain, is of the most fertile class, and, unlike the ordinary Persian "*júlghah*," is rich in the possession of a river. Its length, from east to west, is put down at 30 miles. It is about 16 miles in breadth, exclusive of the ground taken up by the fortress and walls: four of these miles separate the town from the northern, and twelve from the southern hills, while at one quarter of the latter distance runs the *Heri-rúd*, or Herat river, which, rising near the *Kuh-i-Baba*, pursues a westerly course till, passing its namesake city, it sweeps, first gradually, then decidedly, to the north, eventually to expend itself or lose its distinctiveness in the environs of *Sarakhs*. But the later progress of this river, both in its junction with the *Tejend*, and separate diffusion, has yet to be clearly traced. It presents a feature of political as of geographical interest; for it passes between the Persian and Afghan frontier-posts of *Kahriz* and *Kúsún* respectively, and may therefore be considered to mark the Perso-Afghan boundary at the Western *Paropamisus*.

Striking an average between conflicting measurements and otherwise carefully weighing the data before us, I think we may accept a descrip-

tion of the city of Herat which makes it of a rectangular and nearly square form; set almost exactly after the cardinal points of the compass, the faces from north to south being somewhat longer than those from east to west, but all from 1,400 to 1,500 yards. The walls, from 24 to 20 feet high, are built on an earthen rampart of about double their own height. A deep wet ditch which surrounds the whole is supplied, according to Conolly, by springs within itself. More recent information, on the other hand, assumes it to be filled by canals outside the walls, and in such case the supply might be cut off by an enterprising invader. But M. Khanikoff mentions a more palpable obstacle to effectual defence in the existence, at the north-east angle of the walls, and at about 700 yards distance from the bastion, of a broad-crested hill, overlooking the town, and covered with solid buildings easily convertible into batteries. A *mamelon* of this description could hardly fail to attract the attention of an enemy even moderately skilled in the science of sieges. The "Ark," or citadel, is behind the main wall of the northern face. The "Ark-i-Náo," or new citadel, however, intervenes and overlaps the older building. There are five gates, two on the north and one at each of the other faces. A high street traverses the town from the north-west to the south gate, and is the great centre of traffic. The population has been estimated at various figures. Some of these are doubtless erroneous. Others, though inapplicable to the present day, may have been tolerably correct at the time they were recorded: for the political revolutions of Herat have been continual, and must have had sensible influence on the numbers and character of the inhabitants. I do not think that 50,000 can be a very unfair or inexact supposition for the population under the Amir Sher Ali. Such a total would certainly be attained if Yakub Khan or his successor could add the element of stability to successful government. Conolly, who reckoned the number of inhabitants at 45,000, added that there were 4,000 dwelling-houses, 1,200 shops, and 17 caravanserais. As the first reply to his enquiries on the spot had elicited the statement that there were 12,000 houses within the walls, it is not impossible that the reduction to less than half the figure is under the true mark. In either case, the estimate of occupants would seem to be quite sufficiently high for the occasion. The mosque, the domed reservoir, the palace of the Chhár Bagh, and, it may be, the bazaar, and one or two of the larger caravanserais may be named among the more notable monuments of Herat; and if we go beyond the walls, with these may be included the ruins on the Musalla, or place of prayer, and the tombs of the Muhammadan saint, Khájah Abdullah Ansari, and Dost Muhammad Khan.

In 1830, Conolly was of opinion that the city was "one of the dirtiest in the world. Many of the small streets," he wrote, "which branch from the main ones, are built over and form low, dark tunnels, containing every offensive thing. No drain having been contrived to carry off the rain which falls within the walls, it collects and stagnates in ponds which are dug in different parts of the city. The residents cast out the refuse of their houses into the streets, and dead cats and dogs are commonly seen lying upon heaps of the vilest filth."

Vambéry, 33 years afterwards, in the same year that the town fell into the hands of the Amir Dost Muhammad, who did not survive his triumph a full fortnight, gives a gloomy account of its appearance:—"The houses which we passed," he says, "the advanced walls, the very gate, looked like a heap of rubbish. Near the latter, in the inside of the city, is the Ark (citadel), having, from its elevation, served as a mark for the Afghan artillery; it lies there blasted and half demolished. The doors and windows have been stripped of their woodwork, for during the siege the inhabitants suffered most from the scarcity of fuel. In the bare openings of the wall are perched here and there a few wretched-looking Afghans or Hindus, worthy guards of such a ruin. Each step we advance we see greater indications of devastation. Entire quarters of the town remain solitary and abandoned. The bazaar * * * * alone remains." He furnishes, however, a pleasant sketch of the inhabitants, here—as at Constantinople and Alexandria, Baghdad and Bombay—characterised by diversity of races; for there are Afghans, Indians, Tartars, Turkmans, Persians, and Jews.

Whatever objections on the score of outward appearances may arise in contemplation of the town, all travellers agree in commending the beauty and fertility of the Herat valley, said to be capable of affording supplies to 150,000 men. Independently of the immense natural advantages of a river, man has not been idle in the improvement and extension of cultivation by artificial means. Irrigation has been carried on to a considerable extent. The plain south of the walls is watered by a network of eight or nine large and many minor canals. The aqueducts are stated to be superior to those of Bukhara, Samarkand, and Ispahan. The grain produced is abundant; beyond the requirements of town and suburbs together. The bread, the water, the vines, have the credit of special excellence. Yet with all this wealth of means and material, much of the legacy of past ages is disregarded and nullified by the supineness of a present generation. The ruins visible on all sides are not of useless or obsolete works. As one conclusive instance may be cited the neglected "Púl-i-Malan." This bridge of 23 arches can scarcely be considered void of purpose or practical benefit. It is, however, rapidly falling into decay; and as the river has changed its bed, part of it remains barren of object on dry land. On the rising of the waters this state of things is most inconvenient; for the river is at such time no longer fordable, and the Kandahar caravans going to and fro have difficulty in crossing.

Khanikoff on British Commercial Relations with Central Asia, 1858-62.—On the commercial importance of Herat the testimony of Khanikoff is worth noting, whatever the value to be attached to it for present exigencies. In his work, published in 1862, he represented it a centre for all the main routes of Central Asia in an easterly and westerly direction; alleging that since the Marv Turkmans had closed the communications between Transoxiana and Khurasan, Bukhara goods must pass through Herat to reach Mashhad, paying duty at Balkh and Maimana, as well as at the former city. Notwithstanding the relations

with India, European merchandize reached Herat from the west, *via* Tehran, Indian caravans bringing only muslin and silk handkerchiefs, or silver for Hindu usurers, and taking back pistachios, gall nuts, and manna. He found, in short, European commerce in this quarter in a languishing condition, and was struck by a circumstance, already noted at Tabriz and Tehran, that our goods had almost wholly disappeared from the markets of Central Asia, where the English cloths had been replaced by German cloths and Swiss printed calicoes. French velvets, brocades, and jewellery were not in great demand, and Russia was disposing, here as elsewhere, of bar iron, cast iron, brass, steel, and such like, with the full confidence that the Caspian route would remain beyond the reach of all hurtful opposition, though strengthened by a completed network of Indian railways.

In coming now to the question of the road, I must apologise for a delay which would be unpardonable if our journey were from London, but is hardly irrelevant when the starting-point is in Afghanistan.

Abbott's and Shakespeare's Journeys.—Captain Abbott left Herat on Christmas Eve, 1839; Captain Shakespeare followed on the 4th of May, 1840, not five months afterwards. The former, besides his mirza or secretary and personal attendants, was accompanied by a relative of the Wazir Yar Muhammad, but was induced to rid himself of this comfortless escort on reaching the Khivan frontier. The latter was perhaps more fortunate in his assistants, and gives a good report of his Herati Kádhi and son, besides a third Afghan, a gallant Indian irregular trooper, and others of his mixed suite. It must be borne in mind that these missions were conducted at a time when Central India was disturbed, not only by movements from Orenburg and the Caspian, but by rumours from an English camp which had pitched in the very heart of Afghanistan, unsettling men's minds and stirring up national jealousies and religious prejudices on either side the Hindu Kush.

Herat to Marv.—Both Abbott and Shakespeare made their first march to Parwánah, a village 11 miles north of Herat, reached by a good road rising through low hills. Hence, while Abbott was led, two marches off the direct road, to Khushk, the black-tented capital of the Jamshidis, Shakespeare appears to have pushed on in a straight course; first, for 12½ miles, by a good easy road, to a handsome but spacious caravan-serai,¹ old, but not quite a ruin; on the next day, for 45½ miles, to a grassy spot on the banks of the Khushk river. Of the second march he describes the first 17 miles of the road as "truly beautiful," and estimates the elevation of the passage over the mountain crest at 7,000 feet. "There are hundreds of hills," he writes, "sloping off in "all directions, and covered with the most luxuriant grass; every "variety of colour was to be found in the weeds, and every little "valley had its own peculiar stream of the purest water." They afterwards met many black-tented "Khails" or nomad camps, with

¹ I learn from General Abbott that it must have been from this point that the two routes actually divaricated.—F. J. G.

cattle, but water was in places scarce. This was the district of "Bad Khyss," which I take to be "badkhiz," or the "wind arousing," an epithet obtained from the gullies or natural configuration of the country. I am unable to trace the precise locality of the third day's encampment in any published maps, but have placed it according to the distance and data given. The fourth march of Shakespeare's party was one of 30 miles, that is, 18 miles during the night and 12 after sunrise, for 9 miles "through the different little valleys close to "the banks of the Khushk," the remainder along the bed or banks of that rivulet. The fifth march of 44 miles, in two divisions of $6\frac{3}{4}$ hours night and $5\frac{1}{4}$ hours day, respectively, was to the Murghab River. The road traversed was generally good, but quicksands were observed in crossing the Khushk.

I have taken the word "Khushk," *dry*, as spelt by Abbott, in preference to Shakespeare's "Khush," *pleasant*, because it appears to be the more likely etymology; and it seems to me that the "Khushk Assaib," or rather "Khushk Asiáb, *dry water-mill*, of Ferrier's and Vambéry's maps cannot be far from the black tents already referred to as the capital of the Jamshidis. It was Ferrier's third march when going to Máimana. He makes it 7 parasangs, or about 25 miles from Khushk Ribát, and describes the road as "stony, across mountains and valleys, "and frequently cut up by torrents very dangerous to pass after heavy "rains." Abbott, disclaiming all intention to publish any particulars relative to the practicability or otherwise of the mountain chains he was traversing, speaks of "a high plain above Parwánah," whence he continued his route to the mountain ridge of Kaitú, "avoiding the "more direct and difficult passes." Having effected the passage without accident, he descended some grassy heights and pitched in a hollow; moving on, the next day, by a very distressing cross-country path, over steep hills covered with grass, to the Khushk rivulet, which he ascended to the so-called capital. Then passing this point, "down the valley of the stream, averaging about half a mile in width, "and bounded on either side by sloping grassy downs, sprinkled with "flocks of sheep and goats," he halted at a Jamshidi camp for the night. In the morning, resuming his course "down the valley," he came to a place called the "Chhahl Dukhtar," or *Forty Virgins*, and thence to "Kara Tepeh," or the *Black mound*. Beyond this place the black tents were scarce, but large flocks of sheep were found. The shepherds came from Marv, "bringing," we are told,—and the statement is indicative of the local resources,—"water and all other necessities "on asses."

From Kara Tepeh the party marched to a spot two miles short of a ruined castle designated "Kaláh Chaman-i-Bhayd." The last word should, I learn, be "Béd," or "Bíd," which would make the name intelligible as the "Fort of the meadow of Willows." Two castles succeed this, one "Kaláh Hanz-i-Khan," the Fort of the Khan's Reservoir; the other, beyond the Badkhiz, but in the Mauri district, called "the Fort of Maur." After this place commenced, at least in 1840, the kingdom of Kharizm, or more appropriately the Kleptarchy or Kleptocracy of the Turkmans. A reed jungle having served as

the night's camping ground, Abbott tracked hence the Khushk rivulet until its valley was lost in that of the Murgháb. We have now come upon one of the most important rivers of Central Asia south of the Oxus; rising in the Hazára mountains, or northern slopes of the Paropamisus, it flows in a north-westerly and northerly direction past the town of Marv, until it expends itself in a desert swamp.

How far Shakespeare and Abbott followed the same road, or at what point the former fell into the track of the latter it is hard to say; for Shakespeare mentions few places, and these few do not always agree with Abbott's. But it is tolerably certain that they both reached the Murgháb, by following the bed generally of the Khushk. Shakespeare gives no account of the junction of the two. Abbott is more precise, probably from having been the only traveller to whom ocular demonstration was allowed. When the two valleys became one, or near the apex where the two streams flow together, Abbott moved over from the right bank of the Khushk to the "Khail," or camp of Panjdeh, on the left bank of the Murgháb, "passing the ruined vine-yard and deserted fields of a once populous and cultivated district." Here he found 300 black tents of nomads, in the form of two hollow squares. Proceeding along the left bank of the Murgháb until the valley had narrowed in breadth from nine miles to three-quarters of a mile, he crossed by a bridge the dry channel of the Khushk just at the point of junction. Hence to Marv, the route of both travellers must have been, more or less, along either bank of the Murghab; in fact, practically, to all intents and purposes, one and the same.

Shakespeare found the Murghab, on first acquaintance, "a muddy rapid stream, the banks thickly fringed with tamarisk." During the night he moved twenty-two miles along its narrow, sand-hill enclosed valley, on a generally good road, with some steep sandy ascents, and abounding in wood and grass. Cultivation, however, had not been kept up as in the good old times, and as the fine soil would warrant. His next march after sunrise, during which he passed a place called "Sanduk Kuchan," I estimate at 24 miles, taking the figures wanting to fill the one gap in the whole recorded distance to Marv. The next night march was of 22 miles, still along the Murghab, and amid very heavy jungle, to near the "Band-i-Yalatun," or "bank which throws the water of the Murghab into the canal of Yalatun;" an arrangement which had failed in that particular year, owing to a destructive flood. This was followed by a short march at sunrise, in oppressive heat, of 10 miles. The progress of the next night and morning, reckoned in one combined march of 27 miles, was to Yalatun, where was a Governor and *kadhi*. The same process repeated in the following twenty-four hours, for a total of 22 miles, brought the party to the fort and town of Marv.

Abbott's description of the Murghab shows it to be "a deep stream of very pure water, about 60 feet in breadth, and flowing in a channel, mined to the depth of 30 feet in the clay soil of the valley; banks precipitous, and fringed with tamarisk and a few reeds." The valley, once well cultivated, he found, from Panjdeh to Yalatun, utterly deserted, owing to late distractions of the country.

Pheasants, *chakors*, and rock-pigeon were abundant; and there were bears and panthers. At Yalatun "the desert aspect was a little broken " by symptoms of recent culture."

An excellent Russian scholar, Mr. Delmar Morgan, having kindly favoured me with translated extracts from Ritter's "Irán," just published in the Russian language, with annotations by M. Khanikoff, I take advantage of the occasion to notice what is there said of Marv. It may savour of insular self-satisfaction, but I think it quite legitimate, and it is undeniably pleasant to remark that, while English authorities are utilised wholesale in these valuable works thrown out, from day to day, by the Continental press, very little matter is brought to light which has heretofore been kept secret from our own writers and explorers. As compilations, these publications have an undeniable value; for they comprise the latest information obtainable on the particular subjects treated; and I could not fail to observe in the volume under reference, the map of Sistan, prepared from the data collected by an officer of my own mission in 1872. I am not now about to quote literally from Ritter; but his compilation gives me the substance of the following brief sketch.

Marv.—The plain of Marv, though now surrounded by deserts, has had from time immemorial, a reputation for fertility. According to Strabo, Antiochus Soter selected it as a site for one of the cities of Antioch, walling in, for the purpose, a space 1,500 stadia in circumference. Local tradition, on the other hand, takes the origin of the town a little further back, to Alexander the Great. Its ancient renown well accords with the consideration given to it by the Muhammadan Khalifs, and the testimony recorded in its favour by Ibn Haukal in the tenth century, not only for natural products of the soil, but for the learning of its inhabitants, progress in arts and sciences, and encouragement of commercial enterprise. No city had surpassed it in the grandeur of its palaces, the beauty and luxuriance of its meadows and gardens, and the abundance of its fresh water supply. Silk cultivation had been introduced thence into Tabaristan. Other towns sent to Marv to buy silkworms' eggs; while cotton and linen cloths of the finest quality were manufactured there. Two centuries later Edrisi writes that "the river flows past many beautiful houses " and populous villages or hamlets situated on its banks. The residences are an arrow's flight apart from each other, built of baked "clay, and surrounded with gardens." He praises the melons of Marv, its cotton, and the produce of its looms, remarkable for softness of texture, and eagerly sought by traders; and he names ten other towns, then visited by travellers, but now unknown, well supplied with water, and famed for the abundance of their fruits, their trade, their mosques, bazars, and caravanserais; thus proving how flourishing was the oasis of Marv at that particular epoch. In spite, however, of a brilliant early history, the city became a heap of ruins under the destructive inroads of the hordes of Jenghiz Khan; and though again rebuilt, and of considerable repute as a frontier city of Persia, was again laid waste in subsequent years. After the death of Nadir Shah, when

the frontier posts and outlying districts of Persia, if not strong enough to remain loyal or assert their independence, fell to the sword of the most powerful neighbour, Marv held out gallantly, under Bahram Ali Khan (and, according to Malcolm, under his son also), against its Uzbek invaders; but eventually it was subdued. A few words of literal quotation may here be added. "In 1787, Shah Murad, of Bukhara, destroyed the canals and fortress, and removed the greater number of inhabitants to his own city, where a separate community, of them still exists. The remaining inhabitants afterwards migrated to Persia, and the oasis became a desert and camping-ground for nomad Turkmans. The view from the fortress of Marv over the surrounding district is desolate in the extreme. For a distance of twelve hours' ride the ground is strewn with ruins of villages and gardens, and with choked up meadows, exhibiting an occasional trace of verdure wherever watered by river inundation. Fraser heard that the only good building left was a mosque built by Taimur Shah, some ruins of an extensive bazaar, and the tomb of an unnamed warrior.¹ Even now the Turkmans gather, without the slightest trouble, excellent wheat and delicious melons."

Ritter represents the Turkman possessors of modern Marv to be uncouth and illiterate robbers, fanatics without mosques, and more attached to their horses than fellow men. He adds that, in 1832, the Khan of Khiva marched with an army from Urganj to Marv to levy tribute from the Tekeh tribe; and that he established, both at Marv and Sarakhs (then in the hands of the Salors), custom-houses, in order to tax the goods carried by the caravan roads between Mashhad and Balkh. This information is derived from Burnes, who considered the advance of the Khivan troops creditable to the military genius of the Khan. The distance traversed, was fifteen marches, almost destitute of water, wells being dug from stage to stage. A vast herd of camels was employed conveying water and provisions; and of these, about 2,000 perished in the steppe. The Khan, Allah Kuli, commanded on this occasion in person. His father, Rahim Khan, had, however, performed a greater feat. He had entirely crossed the desert to Persia; but he had lost the greater portion of his horses in the undertaking, and was compelled to leave his guns in the sand. Vambéry mentions still later expeditions from Khiva to Marv; one in about 1842, when Medemin, or Muhammad Amin, brother of the then reigning Khan, moved at the head of 15,000 horsemen, against the Sarúk Turkmans; and six campaigns when the same chief, himself Khan, was opposed to the same enemy. The conqueror captured the citadel of Marv and the fort of Yalatun; but his triumph was of short duration; for no sooner had he returned to his capital than the Sarúks rebelled, and put the men, garrison, and commandant to the sword. Then followed a new campaign; and later still, three campaigns against the Tekehs, who, finally joining with the Yamuts, made themselves troublesome opponents. The Khan was killed by these refractory subjects near Marv, and his head sent as a present to the Shah of Persia.

Before commencing the upward journey to Kharizm and its capital,

¹ Probably Alp Arslan.

it may be well to note what Mr. Tylour Thomson writes with regard to Marv, from a visit paid in 1842. This gentleman was then on his way to Khiva from Tehran, *viâ* Mashhad, Sarakhs, and the Oxus. He found the city, known to modern times as Marv Shah Jahan, and, to Persia especially, as one of the four great cities of Khurasan (Herat, Mashhad, and Nishapûr being the other three), "an assemblage of wretched huts, commanded by a small mud fort, in which a Governor of the Khan of Khiva resides, and defended by a few patereros and swivel matchlocks." It had nothing to boast of but a small bazaar to supply the Sarûk and Salor tribes who frequented it. "Marv-i-Kajar," or Marv of the Kajârs (the present reigning dynasty in Persia), evidencing by its name that it is the last built of the four towns of Marv, was roofless; but its streets, walls of houses, mosques, and baths remained, a silent and gloomy record of the past. The Marv of the Seljukian dynasty was marked by low hillocks and a solitary tomb. Ancient Marv had been utterly effaced.

Marv to Khiva.—On leaving Marv, Abbott crossed a dry channel of the Murghab, and proceeded by a well-beaten road, in direction E.N.E. He soon observed to the east the ruins of a former Marv, of which a mosque and several forts were prominent features. The space covered by these remains of bygone prosperity appeared some thirty miles in circumference; so that it might well have included more than the city of the Persian kings. Rejoicing to quit a plain which, in his estimation, was "wretched, though much vaunted," and to which the desert was "a paradise in comparison," he mounted a lame horse, and proceeded in a direct route across the latter towards Khiva. Two return caravans, with slaves, were in company with his own party. One halt, probably the first, was at another "Kara Tepeh," where was a small "Khail," and a sluice of pure water from one of the canals. The next morning the march was resumed "over a plain" encumbered by sand hills, and sprinkled "with low jungle." The lower lands he found occasionally cultivated, with old watercourses and remains of habitations, speaking of a more prosperous period; the country, rather a wilderness than a desert, with abundance of dry firewood, and plenty of camel thorn, but no grass. As we are without detail of the marches of this party, Abbott's review of the ordinary day's procedure must be taken to supply the deficiency. He himself rose at midnight, and sitting at a blazing fire (for the supply of dry wood continued), and sipping tea without milk, awaited the loading and departure of the camels. Riding after and overtaking the latter, he alighted for half an hour, to spread his carpet at a new fire. He then mounted a second time, to proceed silently along a track not wide enough for two horsemen abreast, until day dawned upon the travellers, when they pulled up to get thawed and warmed again. By sunrise they had continued the march, and about ten they sought a convenient place for halting, sheltered from the wind, but exposed to the sun. Breakfast and a short sleep enabled them to resume operations, until about four o'clock, when the night's bivouac was to take effect. The cold was at times very severe. Icicles hung from the camel's beards; on one

occasion snow had fallen a foot in depth. Sand hills covered the surface of the ground; bushes of camel thorn were profusely scattered among the sand hills; nor were thickets of tamarisk wanting.

The greater part of the tract was stated to be safe to travellers provided with passes. But here and there caution was needed, such, for instance, as in the vicinity of a well about the fourth march, noted for forays from Derehgaz. One short passage may be extracted in the narrator's own words.

"The aspect of the desert, or rather wilderness, from Marv to Khiva is that of a sandy plain, broken into the most irregular surface by deep pits and high mounds, the whole thinly sprinkled with bushes of three several kinds, between which grow wormwood and the camel thorn. On approaching Khiva, the surface is often ploughed into ravines and ridges, whose course is north and south, giving some idea of abandoned watercourses, and traditionally reported to be old channels of the Oxus. The ridges are gravelly, but there is no want of sand. Wells on this route are found at long intervals, in one case of 160 miles. The water is generally brackish, but there are exceptions. On approaching Khiva, there appeared a very thin sprinkling of grass, which our horses eagerly devoured. But no dependence is to be placed upon the pasture of this wilderness, and the traveller must provide barley, or *jowâri*, sufficient to supply the place of fodder."

Shakespeare states that the regular road to Khiva crosses the River Murghab, close to the town. As the boat was injured, and the water was deep, he had to proceed in search of a ford. Abbott, on starting, crossed a dry channel. This apparent discrepancy may be attributed to the different conditions under which the two travelled, Abbott was at Marv in January, or the depth of winter, Shakespeare late in May, when the hot season had nearly set in. But there may be, and doubtless are, several branches of the Murghab conveying its waters to the desert below Marv, and some of these may take their rise above that place. Shakespeare's first march was of 12 miles to a Turkman khail, during which no river-crossing was effected. He afterwards moved in two marches of 16 and 17 miles, respectively, or 33 miles in the 24 hours, then only reaching the River Murghab, or, it may be fairly assumed, the main branch of the river. Marching the next morning along the bank for 15 miles, he crossed at an excellent ford, where the stream was about 30 yards wide, $3\frac{1}{2}$ feet deep, and there was a hard bottom. In the evening he started again, intending to make a long march, but at 5 miles he came upon another stream with quicksands. In the morning a third stream met him at 4 miles, when he had difficulty in finding a good ford; and 15 miles further he found a fourth stream, nearly as large as the first, which detained him two hours. It is to be observed, therefore, that modern Marv, such as it is,—in all probability a miserable relic in its reality,—is on the left bank of a main branch of the Murghab; and that Shakespeare crossed that main branch at 60 miles, but did not clear the river wholly until 84 miles north of the town. We have not the recorded bearings, but as we know that the party were bound for Khiva *viâ* the Oxus, and that they

moved "into the desert" at the point last specified, the general line of road may be fairly supposed.

Abbott, as we have shown, took the direct road, the road of the Khans of Khiva on their Marv expeditions. Shakespeare took the road by the Oxus. He tells us there are two; that called the "Rah-i-Takht," or road of the throne, a common Oriental appellation of a flat-topped hill; and the "Rah-i-Chashmah," or road of the spring or fountain. He chose the former, and by it he reached the Oxus in seven days from the last crossing of the Murghab, and Khiva in seven days more from the time of coming up to the Oxus. The first section of the march, one of 165 miles, was a trying one, from heat and want of water; and the guides were perplexed in discovering wells and traffic tracks. Nor was the water, when obtained, always drinkable. The so-called desert was apparently made up of constantly recurring sand-hills and more abrupt mounds, with a lower surface swept over by shifting sand, and studded with dwarf bushes and wild vegetation. Bones of camels, and other signs of past toil and travel, scattered here and there, give little pleasurable relief to the eye of the new comer; but are sometimes useful as indicating a looked-for route. The Oxus was described as a magnificent stream, with rather high banks, and the distance from bank to bank at the point first reached, was estimated at three miles. The body of the water was carried in a serpentine course, now on one side, now on the other of the wide bed, leaving large portions of dry ground covered with luxuriant jungle. Its breadth varied from 300 to 500 yards. The second section of the march to Khiva was about 15 miles longer than the first. For 100 miles the route was chiefly along the bank of the Oxus: one diversion was into its very bed. The remainder was more to the westward, and in the heart of the Khivan country, its villages, and cultivation. The first village noted, since leaving Marv and the Murghab, was at eight miles before Fitnak, which, together with Hazarasp, is mentioned by Vambéry, and is generally found on maps of Khiva.

Mr. Tylour Thomson does not, that I am aware, say that he followed Shakespeare's footsteps from the Murghab to the Oxus; but he must have done so very nearly. He proceeds from Marv direct to the far-famed river; makes his distance thereto correspond closely with Shakespeare's, when clear of the Murghab; and though Shakespeare says nothing of the four intervening wells of Kishman, Yak-keper, Yandakli, and Sirtlanli, nor of Kabakli, perhaps questionably rendered the "pumpkin-ground;" he describes the Takht-i-Suliman, or throne of Solomon, "about 36 miles before reaching the Oxus;" which "Takht" is clearly the same as the so-designated sandhill of his predecessor. Shakespeare says, "the Turkmans believe that Solomon paid it a visit," and calculates the distance thence to the Oxus to be $40\frac{3}{4}$ miles. The $4\frac{3}{4}$ miles in excess of the other account may be readily believed to comprehend a slight deviation of road or inaccuracy in rough computation.

Mr. Thomson writes: "At Deveh Boiún the cultivation begins, and the road, leaving the river, branches off to the left to the town of "Hazar Asp: but it is only on reaching this latter place that the highly-

"cultivated lands of the Khivan oasis are fairly seen. From this place to Khiva * * * the whole country is covered with smiling fields, unwall'd villages, and, as in Europe, houses and gardens in the open fields, a proof of the feeling of security from oppression rarely met with in civilised Persia. The alluvial tract is of little breadth, but is intersected in all directions by canals for irrigation. Every spot which has been reclaimed or preserved from the encroachment of the surrounding desert, is carefully brought into cultivation. The importance attached to husbandry in this country is marked by the national ceremonies in opening the great canals for irrigation, which are annually performed in the spring by the ruler of Khiva in person." He adds, "The ground being everywhere level, single-horse carts of rude construction, the wheels without any girding of iron, are employed by the peasantry for the transport of their farm produce, instead of, as in Persia, being carried on the backs of donkeys, horses, and mules. Against the rearing of the latter there is a religious prejudice."

Mr. Thomson's account of the country between Marv and the Oxus is hardly that of an unmitigated desert. There is a coating of verdure thrown over it in the spring which gives the appearance of a rich sward, extending in all quarters to the verge of the horizon. Nor is it unclothed with jungle. One tree grows to the height of 15 or 20 feet, and the very dryness of the wood renders it all that can be desired for the traveller's fire. But the scarcity of water, the absence of villages, and the severity of certain seasons, must be considered and provided for by those who, however prepared to rough it, in common parlance, would not wish to be classed with the fatalist pilgrim and the homeless wayfarer.

I will not weary your patience by describing Khiva or the sandy tract. For this has been done systematically and well by more than one recent writer, English and foreign. To revert to a prior remark, such persons as have never read, or, having read, have lost recollection of Abbott's and Shakespeare's journeys, should, if really interested in the subject, at once refer to these safe and genuine authorities, for they give no diluted information, nor tell second-hand tales, but speak from personal experience and ocular demonstration.

Jamshidis and Turkmen.—So much has lately been published about the Turkmen, that a very brief notice will suffice for such of the number as are found between Herat and Khiva. But before touching upon these marauders of the plains, something should be said on the people inhabiting the more mountainous country and valleys immediately contiguous, met with by both Abbott and Shakespeare on first leaving Herat. These are, for the most part, Jamshidis; and here we have a division of the Hazára tribe of Eimaks, speakers, according to Lord Strangford, of archaic Persian. They dwell in black felt tents on the banks of mountain streams; they are shepherds, herdsmen, cultivators, and robbers; neither their courage nor general character is of a high order, and they assist, rather than oppose, the traffic in human beings, of the Turkman;

they levy iniquitous taxes on caravans, and, moreover, threaten and harass the Herátis, being only nominally, or occasionally, subservient to whatever chief or Government it appears policy to conciliate; they are scattered here and there about the Paropamisus in a destitute condition; and they now number, according to the best authenticated estimates, from 8,000 to 9,000 families (though Colonel Taylor says 12,000, capable of turning out 4,000 horse). The name, "Jamshid," is that of a Persian monarch of the fabulous period, and its use for purposes of clan distinction strengthens the belief that the families so-called came for the most part from Sistan, the cradle of Persian prehistoric heroes. Abbott represents them of Turkish origin, "short, stout, very dark, with decidedly Tartar features." He may probably refer to the Moghul section of the Eimaks, who are not to be confounded with the Iranians; or it may be to home-returned descendants of compulsory colonists of the Lower Oxus, who had intermarried with local tribes.¹

Shakespeare visited a large "khail" of Jamshidis. The "Khargahs," or nomad tents, of which there were about twenty, were arranged in lines, and there were calves and lambs inside the square. Abbott, as already stated, was at Khushk, the Jamshidi capital, a place dignified by a few mud huts and a *quasi* fort, in addition to the tents. He does not bear testimony to the precarious existence so many are reported to lead. For, in the present case, we are told, "the females seemed very busy at their domestic arrangements, and the children fat and happy."

South of Panjdeh, and before the junction of the Khushk and Murghab, is the beat of the "Salor," a Turkman tribe, which Vambéry calls the oldest recorded in history. He gives them 8,000 tents, and a reputation for bravery. At the actual point of junction of the rivulet with the river, is the beat of the "Sarúk." To these, also, Vambéry attributes a character for valour, and rates the number of their tents at 10,000. The "Tekeh," the greatest and most powerful of the Turkman tribes, reckoned by the same authority at 60,000 tents, have one of their two principal encampments at Marv. Of the doings of these and the Yamuts, much is now communicated by correspondents of the press; and we shall probably hear much more, for there is a great change brooding over the occupants of the Tartarian Steppes. The range of the Tekeh is of considerable extent along the foot of the hills north of Persia and east of the Caspian, and the Yamuts are not only located at the south-east corner of the latter sea, beside the less numerous Goklans, but they have a special Khivan division in the neighbourhood of the Oxus.

Concluding Remarks.

I regret not to have had time to put before you a more complete map to illustrate this paper; the cross roads have not been checked as I could have wished; and the distances, except on the road described, have been taken from two of the twelve sheets of Central Asia, published by the Military Geographical Institute in Vienna.

¹ On this question, see "Selected Writings of Viscount Strangford," vol. ii, p. 160. (Bentley, 1869.)

This latest accession to general Oriental cartography, notwithstanding scarcely unavoidable inaccuracies and occasional vagueness of detail, merits attention as embodying much new matter. But, in asking you to accept for our present purpose a crude production, I may add that it will be my endeavour to prepare for the printed paper a map containing routes and places which have heretofore never appeared in a collective form. Major-General James Abbott, the same Officer whose journey to Khiva is now a standard reference, has kindly retraced in memory his work of 35 years ago; and only yesterday I had the great pleasure of receiving from him a paper of almost historical value, which may be turned to account in entering new, or checking heretofore recorded stations. It is an extract from his original Field Book of a rude survey made from the saddle in 1839-40; and supplies an interesting detail of his twenty-seven marches from Herat, accomplished from the 24th December to the 19th January inclusive.

There is, no doubt, much of truth in the charge laid against England of indifference in availing herself of opportunities to advance Science, readily presented in her political field; and, as a case in point, we have been told that the presence of our Officers in Persia through very recent years, was not utilised for acquiring that knowledge of the geography of the country, notably on the Northern and North-Eastern Frontier, which we, of all nations, should seek to possess. But in blaming ourselves, as we not unfrequently do, for political failures and shortcomings, might we not, at the same time, take credit for having acquired by the above-named or similar agencies, a good deal of information about Eastern and South-Eastern Persia, and Persian Baluchistan within the last ten or twenty years? The labours of the Engineer Officers and others, attached, or otherwise associated with my late Missions, have yet to be made public, and I trust that in two or three months more, their relation in print will afford proof that the pursuit of political objects and achievements of political results have not occupied the undivided attention of British *employés* in Makran and Sistan. And even where opportunity has not been afforded for out-door survey and research, it is believed that a residence of so many Englishmen, and for so long a time, in Persia has not been barren in fruits of observation. That the subject is not a popular one is no fault of theirs; nor is the fact that knowledge stored, is not knowledge used, to be visited on their heads. I can only say that so far as I can bear testimony, from some five years' experience in the superintendence of the Persian Telegraph and $2\frac{1}{2}$ years in Perso-Baluch and Perso-Afghan Boundary Missions, I should have no fear for the Officers employed in either department, were they called upon to pass a competitive examination in knowledge of the country and people, with the Officers of any other service whatever. In the meanwhile, I would take the opportunity of noting that important contributions to Persian Geography will be found in Major St. John's map in course of publication, and in the map¹ illustrative of Colonel Baker's and Lieutenant Gill's explorations about to appear, I believe, in the Journal of this Institution.

¹ Since published. *Vide* No. 79 of the Journal, Plate XVIII.—Ed.

I will say a word in conclusion which relates to what is popularly called the Central Asian Question. Of the cross-roads imperfectly shown in the map before you, I think one of the most important is that which has Sarakhs for its centre. This place, if as well supplied with water as its nearness to the Tejend leads us to suppose, is of great value to Persia, and no pains or expense should be spared to make it a strong outpost. Of course there should be a capable Governor at Mash-had, and one capable of dealing with the Turkmans without room for interference by other and more powerful Governments. But Sarakhs is not the last or most remote of the Persian outposts on the North East. Marv is hers also by natural position, as should be the whole region of the lower Murghab; unless, indeed, Afghanistan had been powerful enough to have ruled the extreme valley of a river which arises among her native mountains. Whatever the geographical or scientific views on the territorial dispositions of rivers, it should be a universal, as it is a natural theory, that the country in which a river rises, and through which it runs its main course, should not be cut off possession at its mouth. The Danube does not offer a parallel case, for it passes through many nationalities; but let us take the Volga, the Seine, the Dnieper, the Thames—the intrusions of a foreign power at the *embouchure* of any of these, is too impossible a contingency to contemplate for an instant. The desert of Asia is not unlike the sea of Europe; its extent and character constitute it an admirable boundary between States; and the annexation by Persia of the basin of the Helmand, when the whole rise and progress of that river has been in Afghanistan, is one of those results which political revolutions have brought about in seeming opposition to the provisions of nature. In like manner any attempt to annex Marv from the Caspian, Aral, or Oxus, could only be instigated by the ambition of barbarism or the recklessness of a wholly selfish policy. Marv, if not independent, or too far from the sources and intermontane career of the Murghab to connect it with Afghanistan, is clearly Persian and part of Khurasan.

As Herat is the supposed key to India, so Marv is the supposed key to Herat. In considering the approach to this quarter from the north, we must not forget the present political as the permanent geographical situation of Bukhara, a place from which there is also a road to Herat of less than 600 miles. Vambéry is an admirable referee on this subject, and should be carefully studied by those interested. Both these roads cross the Paropamisus, a barrier which should be an efficient, as it is a natural one. That which I have had the honour of detailing to you may not be impracticable to artillery or any other arm with energy, ability, and will to aid and direct; but foreign invasion in these countries is beset with difficulties, and it is a question whether, upon the whole, they are not rather increased than removed by civilisation. Nadir Shah did not march to India with modern appliances, but neither had he, on the other hand, the physical incumbrances or moral scruples that would fall to the lot of existing commanders.¹

¹ If I have avoided expressing any more decided political opinions on what may not inaptly be termed the "question of the day," it is because such expression might be here considered irrelevant or out of place. At the same time, I would take the

Lord LAWRENCE said: I think I may take it that it is the feeling of the assembly that we have had from the lecturer a most interesting and valuable paper on the routes from Herat through the desert to the oasis of Khiva. My friend Sir Frederic Goldsmid is well known for the zeal and the skill with which he has transacted matters of the greatest importance in Persia and Seistan. He has now, with much research and care, brought together a great deal of information which has been collected by Officers in the East Indian service. Much of this might have been lost; much when read, would have been interesting in itself; but when a man like Sir Frederic Goldsmid brings to bear the knowledge and information which he possesses so eminently, to illustrate such a subject, he is able to bring together much we should all wish to know, and to present it to us in a style eminently calculated to afford us interest and information in its most acceptable form. Independent of the information which we have obtained this afternoon, and which will I hope be printed for our benefit, we have also had the pleasure, though mingled with mournful feelings no doubt, of hearing the names again sounded of men celebrated in our armies for their enterprise and special abilities. A few of these men have survived to this day, and among them one I am happy to say who is still left to serve his country is Major-General James Abbott. In those days also I may mention the name of Moorcroft, and I must allude to the gallant and excellent soldiers and noble men, Stoddart and Conolly, who met with such a sad and wretched fate in the dungeons of Bokhara. No man will read the history of these times without dropping a tear over their sad fate or without honouring them as true patriots and as heroes. They felt that they were doing a great duty and serving their country, and they laid down their lives as martyrs for the cause which they had undertaken. The subject of Herat and the countries adjacent, is one of considerable importance to India, as is well known to most people in England, and especially to those whom I have now the pleasure of addressing. With regard to the best political arrangements to be effected under the special circumstances of this part of the world, it is not for me now to speak, but on your behalf I tender to Sir Frederic Goldsmid your hearty and grateful thanks for his admirable lecture.

opportunity of recording, as a result of personal experience in many countries of the East, an earnest hope that the attention of our rulers and politicians may not be drawn off from a subject, the thorough comprehension of which is so manifestly important as scarcely to brook an hour's delay.—F. J. G.

LECTURE.

Friday, January 15, 1875.

MAJOR-GENERAL F. C. A. STEPHENSON, C.B., Vice-Chairman of the Council, in the Chair.

PROPOSED ALTERATIONS IN THE ANNUAL MUSKETRY PRACTICE, SO AS TO BRING IT INTO ACCORDANCE WITH THE INFANTRY TACTICS OF THE DAY.

By Captain CHAS. K. BROOKE, 1st Battalion 15th Regiment,
Brigade-Major, Hong Kong.

Read by Colonel the Hon. FREDERIC THESIGER, C.B., A.D.C. to the Queen.

THE question of the proper tactical formation for troops in the field has so engrossed the attention of all military writers, that an important branch of the soldier's training has not received the attention it deserves, or requires; I allude to our annual musketry practice. This all-important portion of our soldiers' training should, like our tactical formations, be brought into harmony with the altered conditions of warfare. In order to discuss this question, it is necessary first to define exactly, what ought to be the object of all musketry exercises. This I hold to be the training of soldiers, to inflict the maximum of loss on the enemy in the minimum of time. This condition can only be fulfilled when troops have been trained to fire with extreme accuracy, and also when this accuracy has been practised under conditions as nearly as possible representing the actual battle-field. Thus all musketry training must be directed to obtain accuracy of fire by means of target-practice; and good individual firing by practices representing as closely as possible the normal features of a battle-field. A few alterations in our musketry regulations, if carried out, would bring them into harmony with the above principles.

The Position drill as laid down, does not recognize the lying-down position, or what is most generally called the "*Any* Position"; and since the number of rounds which will be fired in this position on the field of battle must largely exceed those fired standing, it is desirable that men be trained, on broken as well as on level ground, to choose those positions which are most comfortable to them, the Instructor noticing that nothing in their position would tend to produce inaccuracy in firing. I would therefore suggest that a fourth practice in the

"any position" should be added to the existing drills. This practice could be easily carried out in the barrack-square on rough straw mats, made by the troops themselves.

The first part of our annual musketry practice consists in firing singly 60 rounds at different sized targets at different distances. In this practice only 20 rounds need be fired at ranges below 400 yards. The question arises, does this represent truly the probable proportion of shots in 60 that will be fired at this distance on the field of battle? I think no one will venture to say that it does; overwhelming testimony might easily be produced in order to prove that it is exactly between 150—400 yards that the most effective fire is delivered in action. It will be enough to quote one or two writers of eminence on the subject. Leyman in his "Frontal Attack" states, "that by commencing to fire at long distances, the men get excited and out of hand, and ammunition is expended with little visible result; whereas troops who do not open fire until within effective range, will obtain certain, and in many cases indeed visible results from their shooting, and thus are enabled to establish their confidence and calmness." Boguslawski in his "Tactical Deductions" states, "that the Army which takes to shooting at long ranges will have cause to rue the practice when opposed to a cool adversary." Lastly, von Scherf, the ablest exponent of the "New Tactics of Infantry" (writing when the Mauser rifle had been adopted), states "that fire, if possible, should not take place till within 480 yards of the enemy, and that then only individual firing by word of command should be allowed, when you can no longer dispense with its animating effect, or when special reasons for it arise" (such as the necessity of driving in advanced parties of the enemy, &c.); and "that only when the skirmishers have advanced to within the most effective range of the enemy, say from 320—160 yards, will an unmistakeable command or signal be given, upon which a rapid independent fire as much concentrated as possible upon a point previously indicated will be opened, and will be maintained until the moment of the actual assault."

From these opinions, expressed by able men, who have formed them from actual battle experience, I think it can be safely assumed that it is *within* 400 yards that the most effective infantry fire takes place; therefore it is necessary that the greatest stress should be laid upon our practice within this distance; in consequence, instead of only *twenty* rounds being expended annually in target practices at these vitally important ranges, I would suggest that *forty* rounds should be expended on them, and that the remaining *twenty* should also be expended on them, unless a man is able to show by a high number of points that he is a certain shot within 400 yards.

To carry this out it would be necessary that our present practice be remodelled, and I would suggest the following arrangement, not as absolutely the one possible solution, but as showing the direction in which the necessary alterations must take place.

First: as regards the targets, I would propose the employment of four, the additional one to be called the "Marksman's Target,"—a detailed description of which will follow.

Since the object of all shooting is to disable as many as possible of the enemy, it follows that soldiers should be so trained in peace-time as to be able to fire with accuracy at individual men on the field of battle. In order to obtain this result, I propose that the centre of the target fired at in the 3rd class should be 16 inches broad and 3 feet high; this space representing a man's trunk and thighs when standing, or the whole man if kneeling. The bulls-eye to be 8 inches broad and 18 inches high, representing the vital portion of the trunk.

The ranges and conditions for firing in the 3rd class to be as follows:—

Range in yds.	Conditions.
100	} Standing.
150	
200	Kneeling.
250	Any position.

3rd class Target. (Appendix I.)

Outside measurement	6' × 4'
Area of outer	= 20 sq. ft.
„ centre	= 3 „
„ bulls-eye	= 1 „

The lines enclosing the centre to be $1\frac{1}{2}$ inches broad, in order to be clearly seen up to 250 yards, the area of the centre being enclosed by the inner edges of these lines.

In order approximately to determine the necessary data for getting out of the 3rd class I made calculations, shown in Appendix II, based on the firing of four companies of my regiment, which ranked as 3rd, 5th, 9th, and 10th when finally classified, and of which the average final classification was 68·04.

In these calculations I first determined the number of shots striking the actual bulls-eye's, centres, and outers at the different ranges. Secondly, I compared their areas with that of those proposed, and hence deduced the number that ought to strike the different portions of my proposed targets. Lastly, by making allowance for the different conditions of firing, I calculated that in round numbers a man ought to make in his twenty rounds 10 outers, 4 centres, 2 bulls-eyes, *i.e.*, 16 hits; and from the addition of the calculated value of the shots at the different ranges that he should make 43 points.

From these data I would fix at 43, the number of points a man should make in order to pass into the 2nd class; but the obtaining of these points I would couple with the conditions of making 6 centres or bulls-eyes, and of hitting the target sixteen times. The number of points suggested would most probably have to be altered, when experience has been obtained from extended practices at the proposed target; but the principle of coupling the making a certain number of points with the making a definite number of bulls-eyes or centres, and also with the making a definite number of hits, is the vital part of my propositions; for by insisting on these conditions, a definite idea of the

value of each man's individual firing can be obtained ; this value being represented by the fact that all men in the 2nd class have shown themselves capable of hitting a target 6' by 4' sixteen times in twenty rounds, and further, that six of their shots have struck the centre, representing the body of the man aimed at, *i.e.*, that a little less than one-third of the shots fired by them will put a man *hors de combat*.

This is a definite and palpable gauge of a man's firing, whereas under the present system no such clue is obtainable ; 3rd class shots being able to pass into the 2nd class by only striking the target nine times in their twenty rounds ; while 2nd class shots can pass into the 1st class by only striking the target eight times.

All Instructors of Musketry with whom I have talked on the subject state that they think more of the man who is always on the target than of the man who perhaps makes a little larger score, but who scores bulls-eyes and centres interspersed with several misses.

The following objection will of course be made, *viz.*, that supposing a man has missed the target four times before he has fired his twenty rounds, he will be disgusted, and will no longer try to hit the target with the remainder of them. I admit that this is likely, and I would get rid of the difficulty by stopping a man's shooting, the moment it becomes impossible for him to get out, and by making him commence *de novo*, until, in twenty consecutive shots, he has fulfilled the conditions for passing into the higher class. By adopting the principle of twenty consecutive rounds being sufficient to pass a man from one class to another, encouragement would be given to him to persevere, because no rounds would be wasted, for from the moment the conditions became impossible of attainment, at that moment he would leave off and commence anew.

This principle being conceded, it remains to be considered how its practical working can be carried out. Of necessity it must lead to a slight modification of our present method of conducting target practices, the following rules being absolute:—1st, that no more than twenty rounds be fired by one man in one day ; 2nd, that no man fire less than five rounds at any range, except when it is impossible that he can fulfil the conditions of the class he is firing in. Two examples will best demonstrate the course to be pursued.

a. Private X, after firing seventeen rounds in the 3rd class, has missed the target four times, or has not hit the centre more than once, or has only made thirty points ; in any of these cases, he cannot, with his remaining three rounds, pass out of the class he is firing in, consequently he is ordered to cease firing, and has three rounds in his pouch ; these are instantly received by the sergeant in charge of the squad. As Private X has only three rounds, he cannot fire any more on this day.

b. Private Z, after firing thirteen rounds, has missed the target four times, consequently he cannot get out ; he likewise at once hands his seven surplus rounds to the sergeant ; but if the Officer in command deems it advisable, he can fire five rounds on this day at the first distance in the 3rd class.

The proposed alterations will therefore only entail a little more

labour and care on the Officer keeping the register; and if amended forms were issued in accordance with the above proposals, this extra trouble would be reduced to a minimum.

In order to see if the conditions for getting out of the 3rd class were approximately correct, I fired at Alderney a squad of five, consisting of four Officers and a colour-serjeant, at the ranges, and under the conditions above mentioned, and at my proposed 3rd class target, with the following results:—Average number of points obtained, 53·4; average number of bulls-eyes, 3; centres, 8; and only two misses were made. The shooting was 25 per cent. better than the calculated value; but this was due to the fact that of those who were firing, two were fair, and three good regimental shots. The general opinion arrived at (two musketry instructors being among the four Officers firing) was, that the conditions were fair for the men, and that, as a practical class for training men for their duties in the field, it was greatly superior to our present 3rd class. In Appendix III is given the register of the target practice.

2nd Class.

Since the object of the 2nd class should be to train men to fire with accuracy at a small object, and thus enable them to hit with certainty a single man in the field, and that its conditions should be such as to prevent all but certain shots at the short ranges passing into the 1st class, it is necessary to devise some method by which the size of the object aimed at shall be diminished, and yet which shall not be so small as to cause the probability of many misses; it being assumed that not hitting the target at all, is apt to discourage the men firing, and yet in the 2nd class no shot that does not hit a small object should score.

In order to satisfy these conditions, I would propose the employment of the 2nd class target (shown in Appendix IV); it is of the same size as the proposed 3rd class target, and has a similar centre and bulls-eye, enclosed in a central band 2 feet broad, by two vertical black lines; these lines, and the upper and lower ones enclosing the centre, are 2 inches broad, in order to be distinctly visible up to 350 yards.

The ranges and conditions for firing in this class to be as follows:—

2nd Class Target.	Range in yards.	Conditions.
Outside measurement, 6' x 4' ..	200	Standing.
Area of outer = 8 sq. ft.	250	Kneeling.
„ centre = 3	300	Any position.
„ bulls-eye = 1	350	
„ dead portion = 12		

No shots striking on or outside vertical black bands to score.

By making use of the above target, and by obliging it to be struck a certain number of times, but allowing only those shots which strike in the central 2 feet band to score, the hitting a small object is assured, at the same time few shots are allowed to miss the target. From calculations (shown in Appendix V) similar in character to those described as being employed in order to determine the data on which

to fix the conditions necessary to pass from the 3rd into the 2nd class, I find that in order to become a first-class shot, a man in the 2nd class ought to make 28 points, coupled with the conditions of making 5 centres or bulls-eyes, and hitting the target 16 times. These calculations are based, not on the average shooting of the men at the different ranges, but on shooting 10 per cent. better.

I would propose that the shots striking outside the central band, should be signalled by means of the centre and outer flags held out together, and that on the register they should be shown by the letter H.

In Appendix VI is given the register of the target practice of the same squad who fired at the proposed 3rd class target; the average number of points obtained was 36.4, average number centres and bulls-eyes, 6.6. One Officer failed to get out from want of points, another from not having made the necessary number of bulls-eyes and centres. The opinion of those firing was, that the conditions were fair for a good shot, and that the vertical black lines materially aided the aiming, and that the target was clear and distinct at all ranges.

1st Class.

Since the chance of hitting a single man at ranges over 400 yards is slight, the object of the 1st class should be to train soldiers to hit the small group of men which will inevitably be formed by the enemy during his advance upon a position, the slightest chance of cover having a powerfully attractive force; in consequence, it follows that vertical accuracy is more needed than lateral, that is to say, it is more important to hit a horizontal band than a vertical one, because if men find cover during their advance, they will close up to it, and thus rather offer a broad, than a deep or high object. Again, when acting on the offensive, the object aimed at will be a dense line of men, probably partially sheltered; consequently in this case also vertical accuracy is more needed than lateral. Therefore, in this class men must be trained to attain this vertical accuracy, and this object will, I think, be best secured by a target of the following description, shown in Appendix VII. As it is important at the longer ranges that few shots should go off the target,—first, because their going off discourages the man firing; second, because if he cannot learn the exact spot where his bullet struck, he cannot satisfactorily alter his aim,—I propose that the target to be fired at in the 1st class should be 6' high and 8' broad; the centre 3' high and 8' broad representing a group of four men kneeling. The bulls-eye to be a horizontal band 18 inches high and 6' broad; the central 2 feet portion to be black, and its extremities to be defined by black vertical bands 6 inches broad, the total area being marked by a thin black line connecting those portions which are black, the whole representing the head and shoulders of three men kneeling behind slight cover; the vertical bands at the extremity of the bulls-eye will afford marks by which the distance to be aimed off the central bulls-eye, can be estimated. The outer to consist of the upper and lower 18 inches of the target. The lines enclosing the centre

to be 6 inches broad, in order that the centre may be well defined up to 600 yards.

The ranges and conditions for firing in the 1st class to be as follows:—

1st Class Target.	Range in yards.	Conditions.
Outside measurement, 8' \times 6' ..	400	Kneeling.
Area of outer = 24 sq. ft. ..	500	Any position.
„ centre = 15 „ ..	550	
„ bulls-eye = 9 „ ..	600	

In order to obtain a more definite representation of the value of the shots striking the target, I would propose that at the 500, 550, and 600 yard ranges, those shots which strike the central black portion of the bulls-eye should score 5; those on the white portions and vertical black bands, 4; those within the horizontal black bands, 3; and those on these bands and on the white portion of the target above and below them, 2. At 400 yards I would suggest that no shots striking this latter part of the target should score, but that they should only be counted as hits; this proposition is devised in order to get rid of the chance that a man at this range might be tempted to fire carelessly, owing to the large size of the target. I would also reduce the value of those striking on the remaining portions by 1; thus at this range a central bulls-eye would score 4; a right or left one, 3; and a centre, 2.

The central bulls-eye at the 500, 550, and 600 yards ranges would be signalled by the centre and outer flags raised together, and the hits on the dead portion of the target at the 400 yards range would be similarly signalled.

Since the area of my proposed 1st class target is greater than that of the existing target fired at the same ranges, and since the men firing at the former would be the picked shots of the company, while the latter is fired at by all the men of the company; any calculation of value based on the firing of men at the 2nd class target in 1873 is impossible; therefore I have made none, more especially as only accurate data would be valuable in a calculation which would fix the number of points requisite to obtain the marksman's prize.

In Appendix VIII is given the registers of the target practice made by two squads, one of five Officers and a colour-serjeant, the other of seven Officers and a colour-serjeant, the average number of points made being 45.07, average number of bulls-eyes and centres 9, hits 16.88. The general opinion was that the fair number of points would be 40, coupled with the conditions of making 7 bulls-eyes or centres and hitting the target 16 times. The target was clear at all ranges, and great definition was given by the horizontal black bands, which made it a much better target to aim at than the existing second-class one. The alteration in value of the shots was unanimously approved of, as tending to give a better representative idea of a man's shooting.

Marksman's Class.

Those men who fulfil the above conditions I would classify as marks-

men, and as they will have proved themselves to be good and certain shots at ranges up to 600 yards, it may be assumed that they will probably prove good shots at the longer ranges of 650, 700, 800, 950 yards, and therefore I propose that an extra twenty rounds should be granted to them, in order that they may compete amongst themselves for the prize for being either the best shot of the company, or of the battalion.

These extra rounds, allowing that 10 per cent. of the men firing qualify, would only entail an additional expense of £4 3s. 4d. in a battalion of 500 men—a slight expenditure considering the moral and material advantages to be derived from it; moral, by leading to increased emulation in order to obtain the honour of firing in the marksman's class; material, by affording an extra practice to those who will presumably greatly benefit by it. It may be objected that these extra rounds, being only granted to marksmen, will prevent the mass practising at the longer ranges; I allow that this will be the case, and I hope that the mass will never in action be allowed to fire at any range over 600 yards, because it would inevitably lead to an immense waste of ammunition, and be liable by the confusion and smoke it would cause, to prevent really good shots from doing their best. I would rather that only marksmen fired at these long ranges, for their great use would be when on the defensive, and being placed at the salients of the position, or pushed forward in advance of the position in order to make the enemy develop his dispositions for attack (V. Scherff, page 127, 9th line, and page 129, 9th line), to prevent the near approach of artillery, and to break up the small columns, in which formation the enemy's infantry at this distance would most probably advance. On the offensive, not only would these picked shots be able, to inflict loss on the enemy, and drive in his advanced infantry and artillery, but their cool and deliberate manner of firing would steady the nerves of the remainder of the men of the regiment, who would thus be more easily kept in hand till their services were required at the nearer ranges.

Allowing that it is advisable that only picked shots of a regiment should be practised at ranges exceeding 600 yards, the nature of the target at which these marksmen should fire, remains to be determined.

As regards its size. From the result of the firing of 770 rounds, at ranges of 650, 700, 750, and 800 yards, at a 1st class target, placed in front of an experimental target 18 feet broad and $13\frac{1}{2}$ feet high, I found that of the total number of the shots fired, 270 struck the 1st class target, and 164 struck the experimental target within a 2 feet band enclosing the 1st class target. These shots were distributed as follows: 62 on the band, 1 foot by 8 feet, just above the target, 43 on a similar band above the former, 33 on a band 2 feet by 6 feet on the right side of the target, and 27 on a similar band on the left side. From the above it will be seen that no less than 16 per cent. of the total number of shots which struck the 1st class target and the 2 feet by 8 feet band above it struck the latter; and if it be remembered that from 600—700 yards the bullet has a fall of about 1 in 5, from 700—

800 yards about 1 in 4, and from 800—900 yards 1 in 3, it must be allowed, considering that at these long ranges groups of men having a certain depth, or small columns, will have to be broken up, that these shots which only miss our 1st class target by 2 feet would have a definite value on the field of battle; therefore I would suggest that the target to be fired at by the marksmen should be 8 feet high. This increase of height, besides enabling shots which would be effective on the field of battle to score, would also aid the men firing to obtain quickly the true sighting of their rifles; and lastly, it would compensate for the disadvantages of many ranges, in which it is impossible to see the bottom of the target, owing to very trifling inequalities on the range.

As regards the width of the target, I would suggest that it should be 12 feet wide, in order to enable the men firing to better estimate the exact amount of allowance to be made for their pull off, or for the wind. How often one has seen known good shots unable to get on the target when firing in the first class, from not having any definite idea as to where their shots are going; by increasing the total area of the target this difficulty is obviated, and consequently the training of those firing is aided.

The practical method by which this increase of height can be given to the target is as follows:—Lay three targets with their faces down on the ground, and place a fourth target along their three ends, and secure it to them by means of six screws with nuts passing through the side flange of the target placed lengthways, and through the end flanges of those which will be in a vertical position when raised. The weight of these four targets thus combined to form one-half of the proposed marksman's target will weigh one ton, but as one-half will rest on the ground, the greatest amount of lifting force which will be required at the first moment of raising them will be half a ton, and as four men can take hold of the upper edge, and two men on each upper side edge, eight men can lift together, giving only at the first moment $1\frac{1}{2}$ cwt. for each man to raise, not a difficult feat for any soldier to execute. Thus, as each range possesses eight targets, each 6 feet by 2 feet, no extra targets will be required in order to make use of the proposed marksman's target, and the only expense attending this alteration would be caused by drilling 24 holes in the flanges of the targets and providing twelve screw bolts, not a large sum to demand when the advantages to be derived from its increased size are considered.

In Appendix IX is shown the marksman's target, the bulls-eye being made slightly larger than that of our present 1st class target, in order to make it a good object to aim at up to 950 yards. An extra enclosing line besides that of the centre has been added, for the purpose of obtaining a better representation of the value of each shot. In scoring, the central bulls-eye would score 5, the outer bulls-eye 4, centre 3, and outer 2, at the 800 and 950 yards ranges; and at 650 and 700 yards ranges no shot striking the outer portion of target would score. I have proposed the above ranges because at the present time it is important that the picked shots of a battalion should be practised up to at least 950 yards, and up to the limit of the range of their

weapon, if ammunition could be granted for the purpose; for the value of picked shots will be best demonstrated when they can prevent by their accurate fire the near advance of artillery, and oblige the enemy to break up his closed fraction at long distances.

Having now suggested how 60 rounds should be expended in target practices, it remains to be considered how the other 30 rounds are to be utilized, so as to best train our soldiers for their duties in the field.

According to existing regulations, 10 rounds are expended in volleys at 300 yards, both ranks kneeling, 10 rounds in independent firing at 300 yards, and 10 rounds in skirmishing, advancing from 400 yards to 200 yards, and retiring from 200 to 400 yards. The first question that must be asked is, does this represent truly the proportion of volleys, independent firing, and skirmishing that has recently, or will in the future take place on the battle field? As regards volleys, all writers who speak from experience gained in the last battle fields state that "the cases in which volleys were fired in a downright infantry engagement would probably be easily reckoned; the few cases in which volleys can be well authenticated were when the French were surprised."¹ "Neither French nor Germans ever succeeded in pushing forward battalions or companies to fire volleys."² "Even when on the defensive, to which according to theory, volley firing is particularly applicable, it could so seldom be employed, that the few exceptions prove the rule. Even behind cover, field works, barricades, &c., the fire of *dense clouds of skirmishers* was preferred to bringing forward parties in close order to fire volleys."

From the above facts, I think it may be concluded that an expenditure of three rounds in volleys at 300 yards and of two at 200 yards is all that is necessary for the sufficient training of troops in volley firing.³ It is difficult to estimate the value of independent firing as now practised, but I think it may be assumed that since there is little probability of troops being brought to the front in a closed formation in order to fire volleys, that there is hardly any possibility that they will be called upon to practise independent firing. The nearest approach to this species of firing will be that of the "*dense clouds of skirmishers*" mentioned previously, and for this kind of firing our present practice affords no adequate training. I would therefore suggest that the independent firing practice be done away with, and that the remaining 25 rounds be all expended in a skirmishing practice, which should represent most closely the special conditions under which men will fire on the battle field.

Such a practice must be acknowledged to be the most important and the most essential portion of our soldiers' annual musketry training, as the preliminary target practices can only be considered to be useful, in

¹ "Tactical Deductions," by A. Boguslawski, p. 79.

² *Ibid.*, p. 84.

³ The target shewn in Appendix X, to be 12' broad, 6' high, having a black band 18" broad running across its centre, and line 1½" to enclose a central 3' band; the scoring to be 4 points for shots striking the black band, 3 for the central band, and 2 for the upper and lower portions of the target; due value being thus given to vertical accuracy.

so far as they enable us to classify the men, and to train them to make good individual firing in the skirmishing practice. At the present time all importance is given to the target practices, and the skirmishing is made completely secondary to them; therefore until this order of precedence is reversed and the importance of training men to skirmish inculcated, and not till then, will the skirmishing practice assume the importance due to it, and create the interest in it so necessary for its successful carrying out.

It remains now to be seen how the greatest possible instruction may be obtained from the expenditure of these twenty-five rounds: as this is *par excellence* the battle-field practice, the conditions under which it must be carried out must of necessity represent it as closely as possible; firstly, as regards the object aimed at; secondly, as regards the nature of the ground on which it takes place. We may do much to improve our practice in the former of these points; in the latter, want of necessary ground, and the densely-populated character of the country, forbid any but trifling ameliorations of the actual conditions.

In our skirmishing target practice the object aimed at is an immovable target $6' \times 2'$ in the field, the object aimed at is a mobile man, whose size would vary from $5' 6'' \times 16''$ through $3' \times 16''$ to $1' \times 16''$, according as he is standing upright, kneeling, or lying down. This enormous difference between the object practised at on the range and the object fired at in the field of battle is startling, when it is considered that no real reason for it exists. Our targets have remained unchanged, though the introduction of breech-loaders has altered the character of the objects aimed at on the battle-field. In this point, therefore, it will be necessary, in order to bring our practice into harmony with existing facts, to take to firing in our skirmishing practice at easily-moved man targets, a plan adopted by other nations with great success. As regards the nature of the targets, they must be most inexpensively constructed, otherwise a difficulty would arise to their being introduced into the service; for this reason I would suggest that they should be made of canvas, covered with paper cartoons, and stretched on a light iron frame; a light rod attached to their upper edge would form a back support in order to keep them in a vertical position. It would be necessary to have two sizes, one $5' 6''$ high and $1' 4''$ broad, having a paper representation of a man attached to it, the other being $3'$ high and $1' 4''$ broad, and having affixed to it the representation of a man kneeling. The estimated cost of the blocks from which these cartoons would be printed is 30 guineas for the standing figure and about 25 guineas for the kneeling one. The cost of each cartoon need not exceed 2*d*. The cost of iron framework of a standing target would be about 1*l*. 6*d*., that for the kneeling figure 8*s*. 6*d*. I would suggest that each range should be furnished with six of each size, and that the paper cartoons should be drawn from store as required: by careful patching they could be made to last a long time. I would also suggest that the figure aimed should represent a man in blue uniform, because it is well that our soldiers should be accustomed to fire at this colour, it being the most general colour in all armies except our own. The standing figure should represent a man standing

with ordered arms; the kneeling figure, that of a man at the "present" when on the knee.

As it is probable that men will in the future be called upon to fire at others within fieldworks and behind shelter-trenches, I would suggest that a paper screen, coloured with burnt sienna and 4' 6" high, should be fastened with clips in front of the standing figure in order to represent a man firing behind a parapet, and that a similar screen, 1' 6" high, should be placed in front of the kneeling figure, thus representing a man firing from behind a shelter-trench, it being understood that all shots striking on these screens should not score, but only count as hits.

The skirmishing practice as above suggested represents four conditions likely to occur on the battle-field, and I think that with advantage a fifth might be added to it, viz., the representation of a moving man, by means of a vertical man target placed on a light truck and drawn by cords across the range. The skirmishing practice that I would suggest, and in which the above targets can be thoroughly utilized, is as follows:—

Five rounds in any position, at standing man target, at unknown distances between 400 and 200 yards, this being ensured by the moving both of targets and men, according to a settled plan arranged between the Officer commanding the company and the Musketry Instructor.

Five rounds in any position, at standing man target, having the ground screen on, at unknown distances between 400 and 200 yards.

Five rounds at a moving standing man target at 200 yards, two rounds standing, three rounds in any position.

Five rounds in any position at kneeling man target, at unknown distances between 400 and 200 yards.

Five rounds in any position at kneeling man target, having the ground screen on, at unknown distances between 400 and 200 yards. These ground screens, besides serving to represent men firing behind earthworks, would also train our soldiers to fire at men sheltered behind the natural inequalities of the ground. The above practice I would suggest should be carried out under the direct supervision of a Field Officer, so that the natural tendency of Officers commanding companies to facilitate the execution of this practice, in order to obtain a high score, may be obviated. In short, too much attention cannot be paid to this practice; for, as I have said, before it constitutes the real battle training, to which all target firing has only been accessory.

Before concluding, two points must be briefly adverted to. First, as regards the dress of the men while firing; secondly, with regard to how the "figure of merit" is to be calculated.

When our soldiers practice at the ranges, they fire without their knapsacks. Is this right? Will they on the field of battle be without them. I venture to say no. Therefore, why liberate a man's arms during his training, and curb his freedom when the moment for action arrives? He will be none the better for his training, and when to the excitement of battle is added the *gêne* of unaccustomed incumbrances, the men will fire considerably worse than they themselves

anticipated, and be tempted to get rid of their burdens in order to fire in the condition in which they have been trained. For these reasons I consider that men when firing on the range should be in "marching order" (knapsacks inspected to see that they are full), and thus in peace time be accustomed to the restraint to which they would have to submit in action.

The object of the "figure of merit" is to classify the different regiments, and consequently a spirit of emulation is produced between them, the secondary effect of which is, that all those practices whose score does not tend to swell the "figure of merit" are often pushed on one side and somewhat neglected. This is natural, but it is preventable. Under the existing system, if a man fails to get into the 1st class after the completion of his first 40 rounds, he has to fire again in the 2nd class, if he has succeeded in getting out of the 3rd class, or in the 3rd class, if he has failed in getting out of it. The 20 rounds expended in the 2nd class are likely to be fired under every disadvantage, and simply got through; because the number of points obtained in this class with the last 20 rounds devoted to target practice, in no way affects the figure of merit of the regiment; whereas the 20 rounds in the 3rd class are never fired till favourable circumstances occur, because the leaving many men in the 3rd class considerably diminishes the figure of merit of the regiment; though even here when a man has got out, or when he no longer has a chance of getting out, his remaining rounds cease to interest, as they do not score.

In order to get rid of these difficulties, I would suggest the following method of calculating the "figure of merit":—

1st Period.

The average number of points obtained by every man in his attempt to pass into the 2nd class. This would be arrived at by dividing the total number of points obtained by the total number of rounds fired.

2nd Period.

- a. The average number of points obtained by every man in his attempt to pass into the 1st class.
- b. One-third the average number of points obtained by every man in his second attempt to pass into the 2nd class.

3rd Period.

- a. The average number of points obtained by every man in his attempt to pass into the marksman's class.
- b. One-half the average number of points obtained by every man in his second attempt to pass into the 1st class.
- c. One-fourth the average number of points obtained by every man in his third attempt to pass into the 2nd class.

4th Period.

- a. The average number of points obtained by the men firing in the marksman's class.

- b. One-half the average number of points obtained by every man with his remaining rounds in the 1st class.
- c. One-third the average number of points obtained by every man with his remaining rounds in the 2nd class.
- d. One-fifth the average number of points obtained by every man with his remaining rounds in the 3rd class.

Volley Firing.

The average number of points made in volley firing.

This plan may appear complicated, but when it is examined it will be seen that every shot that a man fires has a direct influence on the "figure of merit," and therefore a sustained interest will be kept up, and the vigilance and activity of the Company Officers will never be tempted to flag for an instant. Every inducement is given in it to make a large score, and also to pass into the higher class, because a second attempt in a lower class cannot be so remunerative as a first attempt in a higher class; in the same manner a third attempt in a lower class is not so remunerative as a second attempt in a higher one. As regards our present registers, little alteration would be required. A dividing line down the space headed "Total Points" would enable "total rounds," as well as "total points," to be inserted, and hence the averages calculated.

In now bringing my paper to a close, I will briefly recapitulate the conclusions arrived at.

1st. That the "any position" must be recognised as the most probable one on future battle-fields, and that therefore our soldiers must be trained to practice it in peace-time.

2nd. That the proportion between the number of shots fired during our annual musketry practice, at short ranges, does not truly represent their probable expenditure on the field of battle.

3rd. That by adopting in principle the proposed re-arrangement of the different classes, and the alterations in the targets, and in the conditions under which they are fired at, our musketry training will be brought more into harmony with the modern conditions of warfare.

4th. That by obliging every man to make a certain number of bullseyes or centres, and hits, before passing into a higher class, a more definite idea of his value as a shot is obtained.

5th. That by arresting a man's shooting, at the moment when it ceases to be possible that he can fulfil the required conditions for passing into a higher class; and by an alteration in the method of computing the "figure of merit"; no shots are wasted, each one having a direct interest attached to it, and thus their value for training our soldiers ensured.

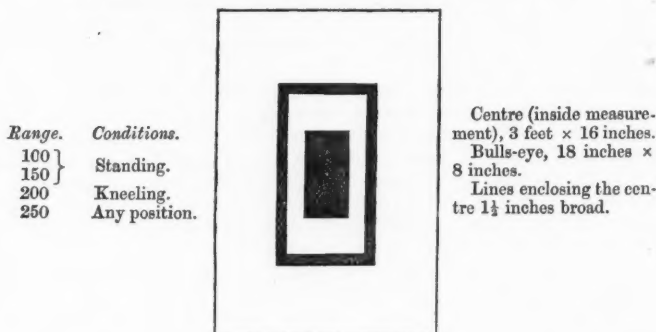
6th. That by establishing a marksman's class, picked shots receive the extra training due to their extra skill.

Lastly. That by the alteration in, and by the importance given to, the skirmishing practice, the battle training of our troops is largely increased, and our musketry training brought into harmony with our "attack formation."

In conclusion, I trust that the suggestions I have made will be

understood to be purely tentative; it must not be thought that I wish in any way to dogmatise on the subject. It has been my earnest endeavour to point out what I conceive to be the errors of our present musketry training, and at the same time to shadow forth the direction in which it may be altered, leaving to those having a wider experience on the subject, the duty of weighing what I have said, adopting that which may be of use, and rejecting that which may be found impracticable.

APPENDIX I. 3RD CLASS TARGET, 6 ft. x 4 ft.



APPENDIX II.

By taking the result of the firing of four companies, I find that—

At 150 yards,	159 bulls-eyes,	314 centres,	270 outers.
„ 200 „	146 „	274 „	232 „
„ 250 „	104 „	204 „	264 „

were obtained by 166 men firing standing.

By calculating the area of my proposed 3rd class target, and by comparing it with the actual one in use, I find that the area of

The proposed outer	=	actual outer	+ $\frac{2}{3}$ actual centre.
„ centre	= $\frac{2}{3}$	„ centre	+ $\frac{1}{3}$ „ bulls-eye.
„ bulls-eye	=	$\frac{1}{3}$	„ „

By making use of the above proportions, the following data are obtained:—

At 150 yards, shots striking proposed	outer	= 270 + 210 = 480

From the above, I calculate that each man at 150 yards, firing five rounds standing, should obtain—

2·89 outers = 5·78 points.
 1·10 centres = 3·30 „
 ·47 bulls-eye = 1·88 „

At 100 yards a man should shoot 5 per cent. better than at 150 yards, he should therefore obtain—

3·03 outers = 6·06 points.
 1·15 centres = 3·45 „
 ·49 bulls-eyes = 1·96 „

Again, at 200 yards, firing five rounds standing, a man should obtain—

2·50 outers = 5·00 points.
 ·99 centres = 2·97 „
 ·44 bulls-eyes = 1·76 „

and if he kneels, I think it may be assumed that his shooting should be at least 20 per cent. better, and he should therefore obtain—

3·00 outers = 6·00 points.
 1·18 centres = 3·54 „
 ·53 bulls-eyes = 2·12 „

Lastly, at 250 yards, firing five rounds standing, a man should obtain—

2·40 outers = 4·80 points.
 ·72 centres = 2·16 „
 ·31 bulls-eyes = 1·24 „

but if a man lie down, his shooting should be at least 20 per cent. better, and he should therefore obtain—

2·88 outers = 5·76 points.
 ·86 centres = 2·58 „
 ·37 bulls-eyes = 1·48 „

To sum up—

Range.	Conditions.	Outers.	Centres.	Bulls-eyes.
100 yards,	standing	6·06	3·45	1·96
150	„ „	5·78	3·20	1·88
200	„ kneeling	6·00	3·54	2·12
250	„ any position .	5·76	2·58	1·48
		23·60	12·77	7·44

In round numbers, 10 outers, 4 centres, 2 bulls-eyes = 16 hits = 43·81 points.

APPENDIX III.

1st Battalion. 15th Regiment. Experimental Firing,

REGISTER OF TARGET PRACTICE.

1st Period.

3rd Class.

No. of Targets fired at, 2.

Dated at Alderney, 1st April, 1874.

Rank and Name.		1st PRACTICE.					2nd PRACTICE.					3rd PRACTICE.					4th PRACTICE.					Total points in period.					
		100 yards.					150 yards.					200 yards.					250 yards.										
		Points per shot.					Points per shot.					Points per shot.					Points per shot.										
		Total points.					Total points.					Total points.					Total points.										
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	Total points.
1		4	2	4	2	2	2	2	3	2	2	2	4	2	0	2	10	3	3	3	2	3	14	49			
2		3	3	3	4	3	3	2	4	3	4	16	2	3	3	2	13	2	3	0	3	2	10	55			
3		3	3	4	3	3	3	2	4	2	2	15	2	2	2	3	12	4	2	2	2	3	13	56			
4		2	2	3	3	3	4	2	2	2	2	12	2	3	2	2	11	2	2	3	3	4	14	50			
5		3	3	3	3	3	3	3	4	3	4	16	2	2	3	3	12	2	3	4	3	2	14	57			
		Total.....					Total.....					Total.....					Total.....					65	267				

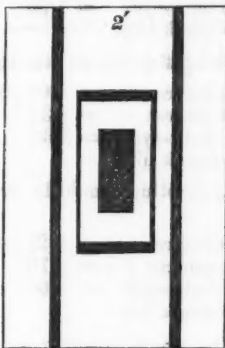
Direction of wind,  ; very strong.

Average points 53.4

APPENDIX IV. 2ND CLASS TARGET, 6' x 4'.

Range.	Conditions.
200	Standing.
250	Kneeling.
300	Any position.
350	Any position.

No shots striking on, or outside vertical black bands; to score.



Centre (outside measurement), 3 feet x 16 inches.

Bulls-eye, 18 inches x 8 inches.

Vertical black lines, and the upper and lower ones enclosing the centre, 2 ins. broad.

APPENDIX V.

By adding 10 per cent. to the number of bulls-eyes, centres, and outers obtained by 166 men, at the 200, 250, and 300 yards' ranges, the following figures are obtained:—

At 200 yards,	161 bulls-eyes,	301 centres,	255 outers.
„ 250 „	114 „	224 „	290 „
„ 300 „	82 „	181 „	271 „

By calculating the area of the proposed 2nd class target, and by comparing it with the actual 3rd class target, I find that—

The proposed outer	= $\frac{1}{4}$ actual outer	+ $\frac{3}{4}$ actual centre.
„ centre	= $\frac{1}{3}$ „ centre	+ $\frac{1}{3}$ „ bulls-eye.
„ bulls-eye	= $\frac{1}{2}$ „	„
„ dead portion	= $\frac{3}{4}$ „	„ outer

By applying these proportions, the following data are obtained:—

At 200 yards,	shots striking proposed outer	= 64 + 200 = 264
„	„ centre	= 101 + 80 = 181
„	„ bulls-eye	= 81
„	„ dead portion	= 191
At 250 yards	„ outer	= 73 + 150 = 223
„	„ centre	= 74 + 57 = 131
„	„ bulls-eye	= 57
„	„ dead portion	= 217
At 300 yards	„ outer	= 75 + 132 = 207
„	„ centre	= 66 + 45 = 111
„	„ bulls-eye	= 45
„	„ dead portion	= 223

From the above I calculate that each man at 200 yards, firing five rounds standing, should obtain—

PROPOSED ALTERATIONS IN THE

1.59	outers	=	3.18	points.
1.09	centres	=	3.27	"
.48	bulls-eyes	=	1.92	"
1.15	blank hits.			

At 250 yards a man firing five rounds standing, ought to obtain—

1.34	outers	=	2.68	points.
.78	centres	=	2.34	"
.34	bulls-eyes	=	1.36	"
1.30	blank hits.			

But if a man kneels, his shooting should be 20 per cent. better, therefore he should obtain—

1.60	outers	=	3.20	points.
.93	centres	=	2.79	"
.40	bulls-eyes	=	1.60	"
1.56	blank hits.			

At 300 yards, firing five rounds standing, a man ought to obtain—

1.24	outers	=	2.48	points.
.66	centres	=	1.98	"
.27	bulls-eyes	=	1.08	"
1.34	blank hits.			

And if he fires lying down, his shooting would be 20 per cent. better; he should therefore obtain—

1.48	outers	=	2.96	points.
.79	centres	=	2.37	"
.32	bulls-eyes	=	1.28	"
1.60	blank hits.			

At 350 yards, I assume that a man standing will fire 10 per cent. worse than he would at 300 yards; but he would fire 20 per cent. better if he fired lying down; therefore at 350 yards, a man lying down, will fire 10 per cent. better than he would at 300 yards standing, consequently he would obtain—

1.36	outers	=	2.72	points.
.72	centres	=	2.16	"
.29	bulls-eyes	=	1.16	"
1.47	blank hits.			

To sum up—

Range.	Conditions.	Outers.	Centres.	Bulls-eyes.	Blank hits.
200	Standing	3.18	3.27	1.92	1.15
250	Kneeling	3.20	2.79	1.60	1.56
300	Any position..	2.96	2.37	1.28	1.60
350	Any position..	2.72	2.16	1.16	1.47
		12.06	10.59	5.96	5.78

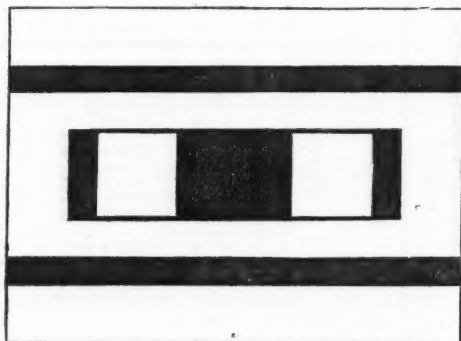
In round numbers, 6 outers + 3 centres, 1 bulls-eye, 6 blank hits,
= 16 hits = 28.61 points.

APPENDIX VI.
 1st Battalion. 15th Regiment. Experimental Firing.
 REGISTER OF TARGET PRACTICE.
 2nd Period. 2nd Class. Number of Targets fired at, 2.
Dated at Alderney, 1st April, 1874.

Rank and Name.	No. as per Practice Return.	1st PRACTICE.					2nd PRACTICE.					3rd PRACTICE.					4th PRACTICE.					Total points in period.						
		200 yards.					250 yards.					300 yards.					350 yards.											
		Points per shot.					Points per shot.					Points per shot.					Points per shot.											
		Total points.	1	2	3	4	5	Total points.	1	2	3	4	5	Total points.	1	2	3	4	5	Total points.	1		2	3	4	5		
1	2	3	4	5	6	3	3	3	3	3	2	2	14	H	H	0	H	4	4	2	0	H	0	R	2	26		
2	3	4	2	2	13	H	2	H	2	2	4	2	6	H	2	2	4	2	10	2	2	2	2	2	10	39		
3	3	2	R	1	11	3	3	2	2	2	3	3	12	H	2	2	3	2	10	2	3	0	R	2	7	40		
4	4	3	3	3	13	2	3	3	3	H	11	2	11	2	2	2	0	2	8	2	2	3	2	2	10	42		
5	3	H	H	4	10	3	2	4	4	2	15	0	2	H	3	2	H	3	7	H	0	0	3	H	3	35		
		Total.....					Total.....					Total.....					Total.....					Total.....					32	182

Average points 36.4

APPENDIX VII. 1ST CLASS TARGET, 6' x 8'.



<i>Range.</i>	<i>Conditions.</i>	
400	Kneeling.	Centre inside measurement, 3' x 8'.
500	Any position.	Central bulls-eye, 18"
550	"	x 2'.
600	"	Outer bulls-eyes, each 18" x 2'.
		Horizontal black bands, 6 inches broad.

APPENDIX VIII. OFFICERS.

1st Battalion, 15th Regiment. No. _____ Company _____ Squad or Section. FORM C. W. O. No. 923.

REGISTER OF TARGET PRACTICE.

3rd Period. 1st Class. No. of Targets fired at, 4.

Dated at Alderney, 23rd April, 1873.

Practice Return.	Rank and Names.	1st PRACTICE.					2nd PRACTICE.					3rd PRACTICE.					4th PRACTICE.					Total points in the period.						
		400 yards.					500 yards.					550 yards.					600 yards.											
		Points per shot.					Points per shot.					Points per shot.					Points per shot.											
		Total points					Total points					Total points					Total points.											
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5		
		2	3	H	H	2	3	5	2	3	0	13	3	0	2	2	3	10	4	3	R	3	3	3	3	3	13	44
		2	0	H	0	H	2	5	0	0	5	3	13	5	0	2	4	10	2	2	2	5	2	5	5	5	16	40
		H	H	2	0	H	4	0	0	3	4	7	13	5	5	3	4	20	4	2	3	2	2	2	2	2	16	45
		H	3	4	3	H	9	2	3	2	R	9	0	0	2	3	3	8	3	5	3	3	2	2	2	2	16	42
		2	3	4	H	3	12	2	0	5	2	3	12	3	2	3	0	13	R	4	R	2	3	3	9	46	50	
		2	H	2	H	3	7	2	2	3	3	15	4	2	3	2	3	12	3	4	2	4	3	3	16	50	46	
		R	H	0	H	H	10	4	4	3	2	16	4	4	3	2	3	16	2	5	0	R	2	2	9	9	35	50
		2	3	0	2	3	9	5	2	2	4	3	2	2	2	5	R	11	4	4	4	2	4	0	14	14	50	
		Total.....					Total.....					Total.....					Total.....					Total.....					106	352

I certify that these practices were conducted strictly in accordance with the Musketry Regulations; that the targets were examined by me before and after the firing at each distance took place, and that the points recorded were obtained by the men opposite whose names they appear.

Signature of the Company Officer superintending the Practice.

I certify that these practices were conducted strictly in accordance with the Musketry Regulations; that the targets were examined by me before and after the firing at each distance took place, and that the points recorded were obtained by the men opposite whose names they appear.

Signature of the Company Officer superintending the Practice.

OFFICERS.

1st Battalion. 15th Regiment. No. _____ Company _____ Squad or Section.
 FORM C. W. O. No. 923.

REGISTER OF TARGET PRACTICE.

3rd Period. 1st Class. No. of Targets fired at, 4.
Dated at Alderney, 24th April, 1874.

Rank and Names.	1st PRACTICE.										2nd PRACTICE.										3rd PRACTICE.										4th PRACTICE.										Total points in the period.	
	400 Yards.										500 Yards.										550 Yards.										600 Yards.											
	Points per shot.										Points per shot.										Points per shot.										Points per shot.											Total points
	Total points.					Total points.					Total points.					Total points.					Total points.					Total points																
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5																	
	0	2	4	3	4	13	5	2	3	5	3	18	4	2	3	2	3	3	3	3	14	2	3	R	3	5	13	58														
	H	4	H	3	H	7	2	3	3	4	2	14	4	3	0	2	2	2	11	11	R	5	2	R	5	12	44															
	2	4	2	H	0	8	2	0	2	5	5	14	3	4	2	3	3	3	15	15	R	2	4	0	5	11	48															
	H	H	3	4	4	11	3	4	3	4	4	18	2	2	2	5	3	3	14	14	0	R	3	5	0	2	10	53														
	2	H	H	0	3	5	2	2	0	4	2	10	4	2	2	5	2	5	18	18	0	R	0	2	R	2	35															
	H	H	H	2	H	2	5	2	2	0	2	11	3	2	3	5	2	5	15	15	0	5	2	3	3	13	41															
	Total										Total										Total										Total										61	
																																									279	

Company { No. _____ Marker. _____

I certify that these practices were conducted strictly in accordance with the Musketry Regulations; that the targets were examined by me before and after the firing at each distance took place, and that the points recorded were obtained by the men opposite whose names they appear.

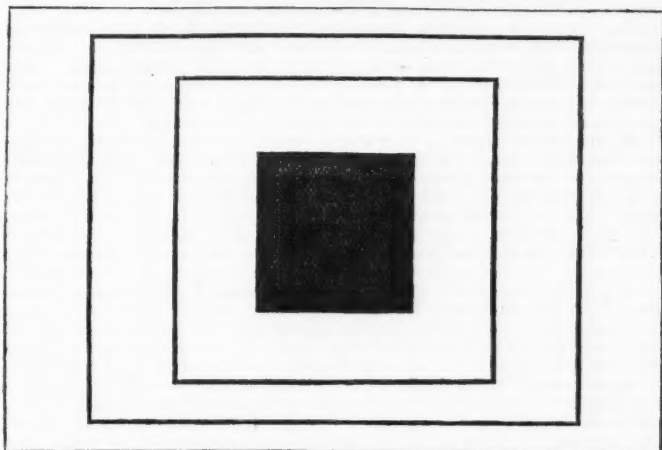
Signature of the Company Officer superintending the Practice.

Company { No. _____ Marker. _____

I certify that these practices were conducted strictly in accordance with the Musketry Regulations; that the targets were examined by me before and after the firing at each distance took place, and that the points recorded were obtained by the men opposite whose names they appear.

Signature of the Company Officer superintending the Practice.

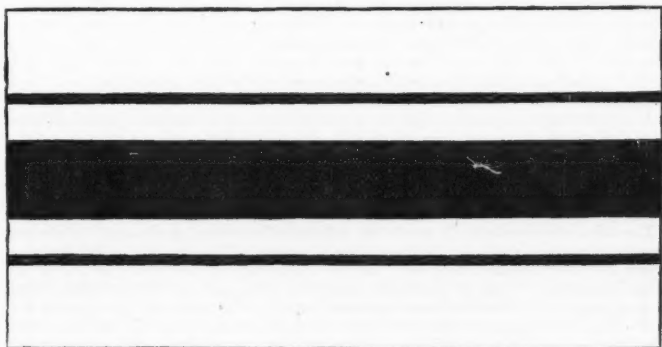
APPENDIX IX. MARKSMAN'S TARGET 8' x 12'.

*Range in Yards.*

650
700
800
950

Bulls-eye, 3' x 3'.
Outer bulls-eye, 5' x 6'.
Centre, 7' x 9'.

APPENDIX X. TARGET FOR VOLLEY FIRING 6' x 12'.



Range.
200 yards.

Conditions.
2 rounds standing.
3 " kneeling.

Centre.
(inside measurement)
3' x 12'

Bulls-eye.
18" x 12'

The CHAIRMAN having announced to the meeting that a discussion was invited upon the various suggestions made in the lecture, and having pointed out two or three of them which were more especially worthy of attention,

Colonel THESIGER said: I was very glad to be able to oblige Captain Brooke by reading his lecture, but I am anxious to mention that I have had nothing whatever to say to the experiments he has made; and although it may perhaps appear a little ungrateful to criticise some of the points he has brought forward, at the same time I am sure it is what he himself particularly wished, that there should be a full discussion on all the important points which he has brought to notice.

I think the most important point which Captain Brooke advocates is, that vertical accuracy must be considered more than lateral. The target which now-a-days troops, either advancing to the attack of a position, or defending it, will have to fire at, will generally be a long line of men at tolerably close intervals. But the height of that target will never, except under very extraordinary circumstances, be the height of the target now given to our men to fire at, namely, six feet; therefore, I think, now that we have the Martini-Henry, with a very low trajectory, introduced into the service, it would be a very great advantage if the necessity of vertical accuracy were more impressed upon our men, and the height of the target were diminished to four feet. I would not, however, diminish its superficial area, but I would simply turn on its side the present 3rd class target, and, instead of making it six feet by four, I would advocate, until further experiments decide as to whether it is necessary to give so much breadth, that it should be four feet by six. The target that men usually have to fire at when on active service, is only about two feet high, but it would be better to begin by degrees and not reduce it too low, lest the men should be disheartened at not being able to hit it at all. No doubt, on first commencing to teach the recruit how to shoot, the great point is to make him feel that he can hit a target, and it is therefore advisable to give him a big one; but, after he has become a trained soldier, teach him to fire at the sized target he will be certain to find when in action.

As to the "any" position, which Captain Brooke advocates, I think it would be rather confusing to have men advancing to the attack putting themselves into all the extraordinary positions you may see adopted at Wimbledon. The only position that really could be allowed with any chance of keeping men in anything like order would be the lying-down position on the stomach. If you once allow a man to lie on his back, the difficulty of getting up from it, and the difficulty of getting himself into it, would tend to confuse, and the Captain of the company would lose that control which is of the greatest importance now-a-days in advancing to an attack.

Everybody, I think, admits that 600 yards should be the maximum distance at which, as a rule, soldiers should fire, and I believe that much effect would very rarely be produced by firing at longer distances, except perhaps at artillery or at large bodies of cavalry.

A very valuable proposal of Captain Brooke's is that the number of hits should be valued more than the number of points. Unquestionably, a man who is on the target continually is far better than the man who merely flukes a certain number of bulls-eyes or centres; and if any plan could be introduced into our musketry-practice which would produce this result, it would, I feel sure, improve that vertical accuracy which is so important.

The skirmishing practice is, no doubt, extremely important, and some experiments have been made in India by the present Commander-in-Chief exactly in the direction which Captain Brooke advocates. At the beginning of last year, at five or six different stations, a line of shelter-tranches was dug, and on the top were placed earthen pots, two feet in diameter, painted white. The regiment was placed 800 yards from them in attack-formation, and advanced, firing upon this position, being reinforced gradually by supports and afterwards by the reserves. No greater proof is required to show how important it really is that vertical accuracy should be more insisted upon than these experiments. At some of the stations at which this practice was carried out, actually only two per cent. of the shots struck the target aimed at! and the highest number that struck was eight per cent.!! Altogether the average at the five or six stations only reached five per cent., 95 per cent. of shots going over the target. This practice shows that the soldier when he is brought to fire at

unknown distances at a smaller target than he has been accustomed to,—but with none of the disadvantages which we meet with in war, such as being fired at himself, which would not steady him or make him shoot straighter,—can only put five shots in every hundred into the front line of a defensive position.

I have no doubt that musketry practice ought to be carried on in heavy marching order; as, if not so practised in peace-time, men would, when on service, either shoot worse, or else get rid of the encumbrance on the first opportunity.

There is another point regarding musketry-instruction, which is, that it takes place for so short a time in the year,—fifteen days altogether,—and then the man perhaps never fires a shot again, except he enters into a company-match or fires for some prize. If our men were only drilled fifteen days in the year, and never allowed to be practised again at it, they would not be very steady in the ranks, and so it can hardly be expected that a man who only fires for one fortnight in the year, when the time comes round for him to fire again, say after twelve or perhaps fifteen months, should prove himself that steady, certain shot, which is the object of all musketry-training. If some change could be made in this respect it would be an advantage.

I cannot agree that the value of independent firing is not so great as it was, and I would deprecate the suggestion that it should be done away with altogether. My own view has always been that a certain number of companies of each battalion when advancing to an attack must always be kept together in line; and as far as I read Von Scherff, he certainly lays down that such small bodies will not suffer a greater loss in that formation than if they were spread over a larger space in skirmishing order. If our troops are allowed to get into that confusion which results from repeatedly reinforcing, where each Captain only has one-eighth of his men in front of him, we shall never be able to extricate them from any difficulties they may get into, or obtain from them their full value as soldiers. I believe these views are now more generally entertained than they were, and, therefore, if you keep a company together as a company in line, even if somewhat opened out, still independent firing will be required. It would be a great pity to lay down that we are going to give up the formation in which we have always been successful hitherto, at all events until we find that we cannot adapt the present requirements of war to that steadiness which is our characteristic.

There is one point, not introduced into Captain Brooke's paper, which I am anxious to say a few words upon. Is it any longer necessary to give money prizes for soldiers firing? You do not give money prizes to the man who is a good drill or gymnast—why then for shooting well? It was no doubt advisable at first to give the soldier some encouragement, but I really think the time has arrived when a man should go through the musketry course as part of his duty, and should not be paid, as it were, to fire well. It would tend very much to prevent that demoralizing effect which, to a certain extent, such a practice has introduced by tempting those who have the power to falsify registers, and to obtain by undue means, either for their companies or for themselves, a larger number of points than have been actually made. I believe a better gauge of the firing of the army would be obtained if prizes were done away with. Every encouragement should be given to company matches, as, I believe, everybody who belongs to a regiment will admit that when the men are competing amongst themselves for a company prize, everything is carried on with the greatest regularity, and it is always certain that the best man wins. I am afraid, however, from the result of our experience in the annual musketry-practice in the Army, that it is not always the case that the man who gets the prize is the man who really made the largest score.

The thanks of the meeting were then voted to Captain Brooke for his suggestive lecture, and to Colonel Thesiger for his kindness in reading it.

Ebening Meeting.

Monday, February 1, 1875.

VICE-ADMIRAL R. COLLINSON, C.B., Vice-President, in the Chair.

NAMES of MEMBERS who joined the Institution between the 19th January and 1st February inclusive.

LIFE.

Salmond, F. M., Captain 21st R. N. B. Fusiliers.
Bayley, J. A., Major late 52nd Regiment.
Heathcote, C. Geo., Lieutenant 5th Fusiliers.

ANNUAL.

Swale, John L., Captain 7th Hussars.	Hoste, D. E., C.B., Colonel R.A.
Darwin, S. C., Lieutenant R.N.	Le Grand, F. G., Captain R.M.L.I.

THE UNSURVEYED WORLD, 1874.

By Staff-Commander T. A. HULL, R.N., Superintendent of Charts, Admiralty.

"From constantly comparing maps and charts, and noting the progress and direction of discovery, Columbus was led to perceive how much of the World remained unknown, and to meditate on the means of exploring it."—*Washington Irving*.

It has been remarked by a modern historian, in reflecting on the brilliant deeds and stedfast valour of our sailors during the wars of Napoleon, that the Navy of this country was destined to rival in the annals of the world the celebrity of the Roman Legions.

But it is not in deeds of arms alone that these distinguished bodies of men are rivals. As in old time "out of the eater came forth meat, and out of the strong came forth sweetness," so out of the horrors of war come arts essential to the blessings of peace. To insure the success of their warlike designs, both Roman soldier and English sailor added considerably to the future comfort and safety of humanity—the Roman, by making roads; the Englishman, by constructing charts.

What roads are to the soldier, charts are to the sailor, and it is easy to prophecy that England's charts will acquire a greater fame than even the Roman roads.

All of you who are accustomed to drive, know the comfort of a good road, on a dark night. Raise that comfort to the highest power of which your imagination is capable, and you will have some slight idea

of the solace that a trustworthy chart is to the captain of a ship in a dark night and in a gale of wind.

But charts, like roads, require constant attention and repair. The roads made by the Romans in Great Britain gradually fell into decay, and the attempts that were now and then made to repair them were insufficient to prevent England falling into a worse state with respect to its highways, than most other European countries.

It is to arrest a similar decay in the charts of our ocean highways, that I have, with the kind permission of the Council, ventured to intrude myself on your notice this evening.

It is, I am sorry to say, too often the fashion when matters do not go quite as we like them, for us Englishmen to find fault with the Government of the day, when the blame really lies upon our own shoulders. The zeal, ability, and management displayed by the various Hydrographers have been most severely taxed in struggling against the rigid economy which the people of this country desired to have carried out in the public service. I am therefore most anxious this evening to persuade my audience to take an interest in this, to Englishmen, important subject, and request their representatives in Parliament to increase the scientific vote, so that the surveying wants of the nation and mercantile community may be promptly carried out.

I flatter myself that I may be successful, for as far back as January, 1873, I detected a slight turning of the tide, when a leader in the *Daily News* pointed out that although our mercantile Navy had steadily increased from 4 to 7 million tons, our surveying forces had as steadily decreased. And yet the Hydrographic Office is in a great measure self-supporting, as the sale of our charts and books is very large, and might be made larger, by using the ordinary mercantile means of increasing the size of an establishment, to meet the wants of the customers.

In December, 1873, the letter of Sir Bartle Frere, in reply to one from Mr. Gladstone, on the Arctic Expedition, came to cheer and encourage the Surveying Service; one portion of it so fully sets our case in its true light, that I must ask you to allow me to quote it.

After a short preamble, Sir B. Frere writes as follows:—

“You will, I am sure, pardon me for taking exception to the expression in your letter which indicates an opinion that voyages for survey or discovery are not strictly ‘professional naval services.’ I believe that in these days, when it is so difficult to find a seaman’s training for our young Officers and men, when so much of the work is done by machinery, there are few better naval schools than a surveying ship; and that, if such ships were multiplied, not only would commerce benefit, but your men-of-war would be better supplied with practical seamen, both among men and Officers, than is possible at present.”

“This is still more the case with regard to any Arctic voyage of discovery. Service in the Arctic Seas, under any conditions, is one of the best possible schools for seamen, and is one of the few schools which now remain by which a thorough seaman can be formed, quite equal to the best men of former days.”

"Moreover, as a matter of fact, some of our very best practical Officers are men who distinguished themselves in Arctic exploration; and I doubt whether there is a single hour of any Arctic voyage of discovery which, in a strictly professional point of view, may not be considered well spent as training for any naval service."

I hope, Sir, to be able to show how correct were Sir Bartle Frere's assertions.

The above letter called forth another vigorous article from the *Daily News*, in January, 1874; while the *Geographical Magazine*, edited by Mr. Clements Markham, one of the Secretaries of the Royal Geographical Society, in an able article in the April number, on the "Hydrographical Department of the Admiralty," called attention to the reductions in the scientific force. In the July number a similar article on the "Indian Marine Surveys" showed that although it was one of the obvious duties of a country with an extensive seaboard and a great seaborne trade, to provide for the safety of the vessels which frequent her ports, by the provision of lighthouses and buoys, and above all, by the preparation of reliable charts and sailing directions, yet nothing had been done for a space of 12 years for the coasts of our Indian Empire.

It was thus that the change in public opinion, acting upon a mind I fear more enthusiastic than intellectual, nerved me into drawing up this paper, and constructing the chart before you.

On this outline chart of the world I have endeavoured, by means of colour, to depict, faithfully, the present state of hydrography; and I fear that there will be little difficulty in showing that the title given to the chart, is a correct one. The surveyed coasts are coloured *red*; those only partially surveyed, *blue*; while coasts that have merely been explored, are coloured *brown*.

On the small chart (Plate II) which accompanies this paper however, the shores, marked by a *heavy coast line*, are pronounced to be surveyed; the *shaded* coasts are only partially surveyed, *i.e.*, although the charts of those regions answered tolerably well for the time when they were made, modern progress, steam, and the increase of shipping, require that these coasts should be more thoroughly examined. A large portion of the chart is drawn only in *fine outline*; this indicates that such portions have not been surveyed; they have been merely *explored*. The bridle-paths or log-roads of the ocean, cut and laid with wonderful energy and ability by such men as Dampier, Cook, Vancouver, and others, whom Froude has well spoken of as "England's forgotten worthies." They are forgotten, perhaps, by the many, but well-known to a few, who, although feeling themselves very far the inferiors of these Vikings in ability, are nevertheless animated by the same earnest wish to do their work at home and abroad fearlessly, against all risks, and to whom such sailors become patterns worthy of even the faintest imitation.

In the chart, from the vastness of the subject, I fear many errors will be detected by sailors knowing the respective coasts; I shall only be too glad to find that there should be more thick coast line upon the chart, but I trust no one will be able to remove that line, or the shading.

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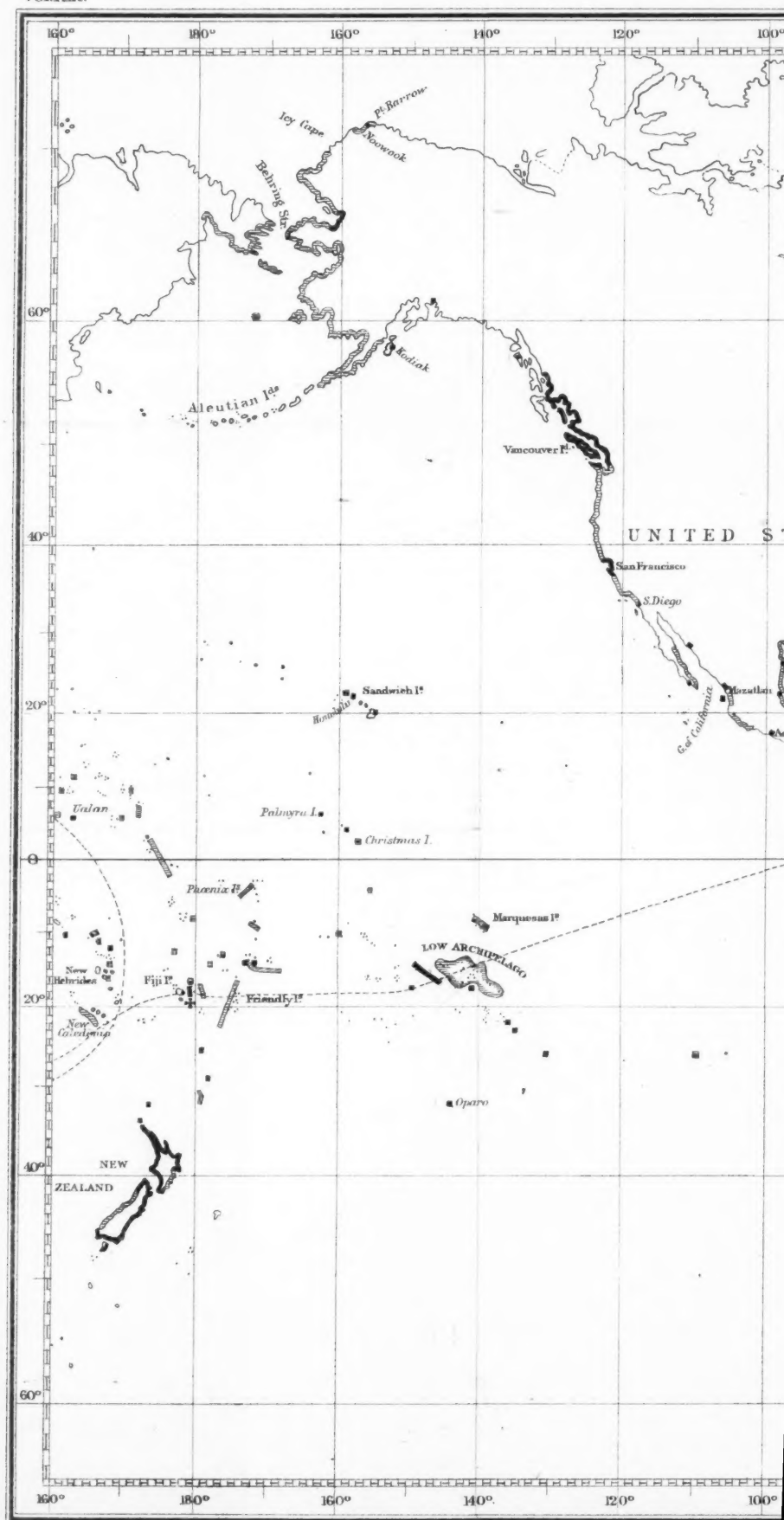


CHART OF THE WORLD

To accompany Staff Commander Hull's paper on "The
Coasts Surveyed ~~~ Coasts Partially Surveyed ~~~ Coasts

Surveying Vessels now employed.



CHART OF THE WORLD.

by Staff Commander Hull's paper on "The Unsurveyed World, 1874."

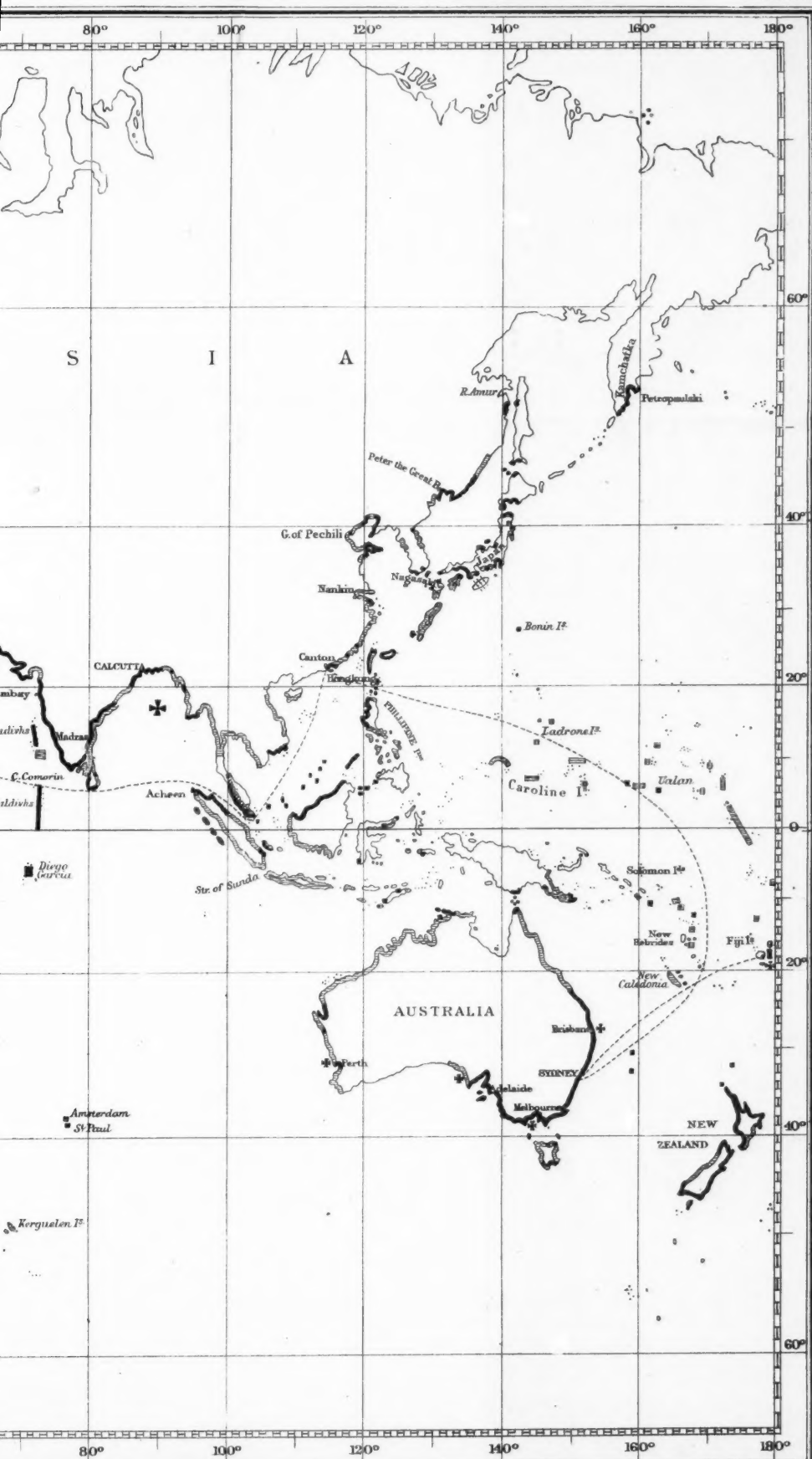
and ~~~ Coasts Partially Surveyed ~~~ Coasts only Explored ~~~

✱ Indicates stations



icates stations of detached Government Surveying parties, working in hired vessels.

Pl. II.



The ships upon the chart show the stations of the three regular surveying vessels at present in commission; the crosses show the head-quarters of Officers stationed on shore, doing their best with hired boats and crews. The large cross in the Bay of Bengal, represents the Indian Marine Survey, lately established by Lord Salisbury.

Marine surveys are carried on, either by regular men-of-war fitted for the purpose, or by small hired vessels with hired crews, the latter being adopted where practicable, with a view to economy. I will, therefore, first call your attention to the surveys at present in progress, taken chiefly from the Hydrographer's report to the Royal Geographical Society in May last.

First, there is the "Shearwater," under Commander Wharton, lately employed upon the east coast of Africa, and in taking the Transit of Venus-observers from the Cape to Rodrigues. The "Nassau," under Lieutenant Gray, is still working upon the east coast south of Zanzibar, where their labours have lately been rewarded by the discovery by Navigating Lieutenant J. Dixon of a fine harbour; and the "Sylvia," stationed in Japan, where Captain St. John and his able assistant, Navigating-Lieutenant W. Pearce, are ordered to survey the southern coast of Nipon. The half ship, on the east coast of England, represents the "Porcupine," wherein Staff-Commander John Parsons, with two assistants and a hired crew, have been closely sounding the approaches to Harwich; the work extended from Orfordness to the Naze, and included seaward as far as the Shipwash and Gunfleet Sands. A similar close examination of the shores from the South Foreland to Dungeness was made; the soundings extending from the coast from three to five miles. Dover Bay was also surveyed in close detail, in anticipation of the proposed harbour-works, in continuation of the Admiralty Pier.

Staff-Commander D. Hall made during 1873, in addition to local surveys of the Medina River and Cowes Roads, a minute examination of the bar at Portsmouth Harbour. This survey, consequent on the dredging operations of 1871-2, shows that the proposed depth of 20 feet at low water ordinary spring-tides, has, with the exception of a few spots of 19 feet, been realised. The completion of this valuable channel into our great naval arsenal cannot be overrated. Up to 1863, a line-of-battle ship was obliged to discharge her guns in order to proceed from Spithead to Portsmouth Harbour; now any ship, drawing 25 feet, can enter at three-hours' flood, and the heaviest draft ship at high water.

East Coast of Ireland.—Staff-Commander Kerr and two assistants, in a small hired steamer, have made a patient examination of the off-lying shoal banks between the Tuskar Rock and Wicklow Head. The changes that had taken place in these banks, since their survey in 1844 by the late Captain Frazer, have been of sufficient importance to navigation to demand this re-survey, and to necessitate their re-buoyage, a work now performed by the Commissioners of Irish Lights.

An examination of the bar at Wexford, at Kingston Harbour, the bar of the Liffey River, and the new cutting through the bar of Lough Carlingford, formed also a portion of the season's work. Gratifying

marks of improvement present themselves in the two last-named localities. The bar of the Liffey has now 15 feet at low-water-springs over a breadth of two cables, and a narrow lane of $17\frac{1}{2}$ feet. In 1800, the greatest depth was but $5\frac{1}{2}$ feet; in 1856, 13 feet. Lough Carlingford Bar, with its cutting of 400 feet wide, and a depth of 18 feet, opens up a fine harbour. A line of steam-vessels now runs to the new harbour-works and railway at Greenore, on the west side of the Lough.

Navigating Lieutenant Millard is continuing the survey of the north coast of Sicily, on which Commander Wharton in the "Shearwater" was engaged, before she was detached to increase the squadron required off Zanzibar.

West Indies.—Staff-Commander George Stanley and one assistant, in a hired schooner, have been engaged on the south coast of Jamaica. The chief operations of the survey were the charting and sounding off to the 100-fathom line, the coast between Port Royal and Morant Point—a work of difficulty, owing to the fierce trade-winds which usually blow in that district. In the latter part of 1873, yellow fever, of a malignant type, broke out at Kingston and Port Royal. Many deaths ensued, and among the victims was a promising young Officer, Navigating-Lieutenant Thompson, attached to the survey.

Newfoundland.—Navigating-Lieutenant William Maxwell and party, in the hired steam-vessel "Gulnare," have been actively engaged in various localities. On the south coast the survey progressed 20 miles to the eastward. A re-survey of Port Hood, in Cape Breton Island, owing to great changes in the depth of water in certain parts, was made at the request of the Government of the Dominion of Canada. The coast of Labrador, from Cape St. Lewis to the latitude of 54° N., was also examined, the prominent head-lands fixed, and outlying islands surveyed. The short time during which this survey can be profitably prosecuted makes it an arduous service. The difficulties of the season's work at the beginning were further enhanced by the immense number of icebergs aground along the shore.

In Western Australia, Navigating-Lieutenant Archdeacon and his assistant have surveyed, in laborious detail, the entrances and approaches to Cockburn Sound, Owen's Anchorage, and Gage Roads, with the view to certain harbour-works in the interests of the colony. The service on this exposed coast in whale-boats, and with crews found by the colony, by which slender means the duty was accomplished, is worthy of record. The party have now completed the northern and western approaches to Swan River, and surveyed the small, but rising port of Champion Bay.

In South Australia, Staff-Commander Howard and staff have completed the soundings off the southern shores of Kangaroo Island. In Spencer's Gulf, several islands and dangers seaward of Port Lincoln were examined, and soundings in detail were taken. The coast-line from Cape Catastrophe to Point Avoird, the inner waters of Coffin's Bay, and the sea-coast thence to Point Drummond, have also been surveyed. Soundings off the wild line of coast, westward of Cape Catastrophe are now in progress.

Victoria.—The surveying party under Staff-Commander H. J. Stanley have been chiefly employed in completing the coast-line of King Island at the western entrance of Bass's Strait, and in sounding around. The bank of soundings, extending seaward from King Island in the direction of Portland Bay, was found to extend 30 and 40 miles from the coast, and then to drop suddenly to depths greater than 150 fathoms. This bank of soundings should afford material aid to the navigator making the land in thick weather.

Queensland.—Staff-Commander Bedwell, in the hired schooner "Pearl," aided by a steam launch, is steadily working northward towards Torres Straits. Port Bowen, Island Head, Strong-tide Passages, Shoal-water Bay, Broad Sound, and several islands of the Northumberland group, have been included in the year's survey. Navigating-Lieutenant Connor, detached from the "Pearl," has been employed surveying the Brisbane River, and the entrance of Endeavour River where Cook refitted the "Endeavour" in 1770, after nearly losing the ship on a reef in the neighbourhood.

South-west Pacific.—The cross near the Fiji Islands represents Lieutenant L. S. Dawson, R.N., our itinerant surveyor in this part of the world. Lieutenant Dawson is placed at the disposal of Commodore Goodenough, to carry out such work as may be most urgently required. I can answer from some years' experience of this Officer, that if he had a ship under his command, he would not only be able to do more work, but would also soon turn his Officers into Nautical Surveyors.

The large cross in the Bay of Bengal represents the Indian survey lately established under Commander A. D. Taylor. I shall treat of this survey farther on.

In addition to the above, we have the assistance of a few zealous Officers of the Royal and Mercantile Navies; the Surveying Service like the Navy and Army possessing its volunteers. Their services will be presently alluded to.

Returning to the coasts, those of England may be considered as surveyed; but let me impress upon your minds, that owing to their shifting nature, the sands surrounding our shores require constant watching and examination. A late celebrated minister once remarked, as a reason for reducing the surveying staff, "That when he had last gone out of office, twenty years before, he had left an Officer surveying the mouth of the Thames; and on his return to Whitehall he found the same Officer employed upon the same duty."

Now, politically, I believe this was a very clever remark, but hydrographically it was a little dull, for the mouths of rivers are often found to be as changeable as the minds of men. To keep the British charts in good working order, a strong surveying staff is not merely necessary, but absolutely indispensable.

The dark line naturally prevails over European coasts. Dutch and French coasts are so marked, but a glance at the charts will show that shade is, as a general rule, the correct symbol for the shores of the Peninsula. In the Mediterranean, the coasts of Algiers and

Tunis are surveyed as far as the Gulf of Kabes; the coast, then, with the exception of the harbour of Tripoli, is little better than explored or unsurveyed until we reach Benghazi; thence to Alexandria it may be called partially done, while from Alexandria to Iskanderoun, we are again upon a well surveyed shore.

But I will not weary you with a description that I fear would be tedious; to make the paper, therefore, more interesting, we will return to Plymouth, take ship, and go a voyage round the world, noting as we sail along, the surveyed and unsurveyed shores that we pass.

Madeira and the Canaries may be considered as done; the Cape de Verd Islands, however, require further examination; on reaching the coast of Brazil, we first anchor at Bahia, a surveyed port, with however some unexamined shoal-ground on the western side of the entrance.

Pushing onward to Rio we are still on the black line. Leaving that beautiful harbour, we enter a partially-surveyed region until we come to the River Plate, of which a survey is much required; it was patched a few years back by Lieutenant Dawson working in a gun-vessel detached for the purpose; the French and Americans have also contributed portions, but it has never been fairly surveyed throughout.

The partial survey of Admiral Robert FitzRoy carries us next to Cape Virgins. In mentioning the name of FitzRoy, I must pause to admire how much was done by this earnest surveyor, who with comparatively small means, and in an extraordinarily short time, mapped the Continent of South America from the River Plate in the Atlantic, to the River Guayaquil in the Pacific.

Admiral Sir Francis Beaufort, in his return made to the House of Commons in 1848, remarks, "That all that is *immediately wanted* of these shores has been already achieved by the splendid survey of Captain Robert FitzRoy."

I call your attention to the important words "*immediately wanted*," that was upwards of a quarter of a century ago, before the days of steamships, 375 feet long, and before the Strait of Magellan was the high road to the Pacific Ocean.

Rounding Cape Virgins, we enter the Strait of Magellan. Excellent charts, constructed by Captain R. Mayne, R.N., and his able Lieutenant Francis Gray, carry us safely onward for 110 miles, when we again enter the shaded or partially surveyed ground. After passing the southern bend of the straits, the "Royal Naval Reserve" comes to the assistance of the Hydrographic Office, in the person of Lieutenant S. T. Lecky, a worthy Fellow of the Royal Geographical Society, and a Captain in the service of the Pacific Steam Navigation Company. This gentleman, ably assisted by Officers whom he had trained to the work, has furnished us with a running survey (that would reflect credit on any Admiralty Surveyor) extending from Cape Cross-Tide to Cape Pillar, a distance of 100 miles. In his last voyage he made several valuable corrections and additions to our charts on the coast to the northward of Cape Pillar. I may here mention that Captain Lecky acquired his knowledge of nautical surveying when in the service of the Honourable East India Company.

We should like to continue our voyage by the inner channels leading northward of Magellan; but there are orders from the owners against using these partially surveyed waters, and we are reluctantly forced into the Pacific (an ocean by no means worthy of its name in the vicinity of Cape Pillar), with a loss of fuel and comfort, and with great wear and tear to ship and engines.

Captain Mayne's work combined with that of Captain Lecky (whose survey enabled the Hydrographic Office to connect the detached works of King and FitzRoy), supply a tolerable chart of the Strait of Magellan; but the rapidly increasing traffic of large and powerful steamers through this great connecting link between Europe and the western coasts of America, points urgently to the necessity of completing the survey of Magellan Strait, and the channels northward to the Gulf of Peñas.

Pursuing our course along the coast of Chile, whose increasing trade with this country would be much benefited by better charts, we touch at Valparaiso, Callao, and Payta; but it is not until we reach the River Guayaquil that we are in the vicinity of a coast, of which we possess reliable charts. From Guayaquil to Panama we are on the dark line, and, therefore, venturing nearer to the shore, we can coast along one of the most beautiful and interesting parts of the globe; passing La Plata Island, where Drake divided the spoils of the *Cacafuego* in 1579; Gallo Island, where Pizarro drew the line on the sand, over which thirteen of his followers crossed; this famous round dozen believing in their leader; Gorgona, the pleasant island to which this same leader retreated after leaving Gallo, and whence he sailed to conquer Peru.¹

Entering the Bay of Panama we pass the beautiful Pearl Islands, which have been well described as a perfumed archipelago, lying like baskets of flowers on the tranquil surface of the ocean. To the eastward lies the Gulf of San Miguel, where Balboa, after a journey of twenty-five days across swamps, rivers, and woods, which had never been passed but by the straggling Indian, took possession of the Pacific Ocean in the name of the King of Spain and the Indies. Memories of old times and scenes are a little running away with me, but there is really a great advantage in being able to keep close to these shores, for not only is the current favourable in the passage to Panama, but as it is a branch of the cold Peruvian Stream, a pleasanter temperature is enjoyed than when farther from the coast.

I must, however, in justice, observe that rains are at all times frequent, and that our trip should be so timed as to pass this coast in the fine season when, as old Dampier says, "the rains are more moderate than in the wet season, for then it pours as out of sieve."

Pausing at Panama, let us reflect upon the advantage to English commerce of continuing the survey (so well begun, by Sir Henry Kellett between Panama and Guayaquil) from Guayaquil to Cape Pillar at the entrance of the Strait of Magellan. The trade of this part of South

¹ Mr. Clements Markham, in his "Reports on the Discovery of Peru," published by the Hakluyt Society, believes sixteen to be the correct number, including the pilot Ruiz, who returned to Panama to obtain another vessel.

America has increased in a marvellous manner, through the great revolution which the introduction of steam has made in the system of transport of goods by sea. The enterprise of the Pacific Steam Navigation Company has diverted the trade from the Isthmus of Panama towards the natural channel of the Strait of Magellan. So successful has been this new current of trade, travel, and commerce, that the Company's fleet of magnificent steamships barely suffices to meet the demands of the extraordinarily developed commerce of the South Pacific.

In a statement of the steam companies engaged in the trade of the Pacific Coast, from a Report made by the Statistical Office of the Republic of Chile, Valparaiso, 16th September, 1874, we read as follows:—Pacific Steam Navigation Company, 56 steamers; South American Steamship Company (native line), 10 ditto; German, "Kosmos," 6 ditto; Belgian, 4 ditto; White Star Line, 4 ditto; Compagnie Générale Transatlantique, 3 ditto;—total, 83 steamers. The steamships of the first-named company made 45 voyages from Liverpool and back, the gross receipts being stated at three million dollars for cargo; nearly 2,000,000 dollars for passenger-, and 120,000 dollars for postal-service. Altogether 524 voyages on the coast, and 124 to Europe were made by the various steamers enumerated. This year the depression in financial centres has led to some of the above lines being withdrawn from the trade on this coast, and the Pacific Steam Navigation Company have largely reduced the number of steamers employed on their line *viâ* the Straits of Magellan, the sailings now being fortnightly in lieu of the weekly service carried on last year.

The annual cost of carrying on the survey of the coast of South America would, I believe, be about £14,000 a year, a little less than you willingly allow to be spent on some experiment in shipbuilding that may, or may not succeed; while of the success of this survey, there can be no doubt, for not only would you be constructing charts for the benefit of the mercantile navy; but, as I shall presently show, you would be establishing a first-class finishing school, which, in giving your Naval Officers the opportunity of putting into practice what they had learned at Greenwich, would enable them more efficiently to protect the trade they were helping to create. From the praiseworthy efforts which the Chilian Government are now making to improve our charts of their coasts, I feel sure of their assistance and co-operation in this work. They would be only too glad to send their Officers to school in our vessels, and thus, after a few years, we should be able to carry out the dream of a political economist and "let the Chilians survey 'their own coasts.'"¹

Looking northward from Panama, there is much work to be done. The rising trade of the Central American ports calls for more attention to coasts, of which, when to the northward of the Gulf of Fonseca, we have little information since the days of Malaspina in 1794. I am glad to be able to state that during January we received American

¹ In the "United Service Gazette," of 30th January, it was stated that the Naval Department of the Chilian Government had organised three hydrographical explorations on the coast of Chili.

surveys of the coast and Gulf of California which will enable me to shade those shores.

In the North Pacific Ocean, that centre of commerce, the Sandwich Island group, is, I regret to have to point out, unshaded. Our chart of that group is said to be "from various but imperfect authorities." Captain James Cook who, considering his short stay, gave us, in 1778-9, a good exploration; and the United States exploring expedition in 1841, added to our knowledge of this archipelago. Something better is, however, required in 1874.

But I must push on from Panama, or we shall not get round the world to-night. From Panama, we shape our course for Tahiti; passing the Galapagos, which may be considered as sufficiently well surveyed for the time, we come next to the Low Archipelago in which the three symbols are blended. What is first wanted here is to examine certain tracks which ships are likely to follow in their passage from Panama, or Valparaiso, through these dangerous patches of coral. The comfort such a road would give to the sailor is something beyond a landsman's understanding. Leaving the beautiful and famous Tahiti, where you will all remember Captain James Cook observed the Transit of Venus in 1769, we pass on through the Friendly Islands and Fiji archipelago. Here reliable charts are much wanted to clear away the doubtful dangers of this part of the Pacific, which render the nights of the captain as uncomfortable as those of a parish doctor in a poor neighbourhood. He is always being called, has to turn in all standing, which means in plain English, going to bed in his boots.

Many of my hearers will remember the graphic account of the discomforts of shipwreck among the Fijis given by the Earl and the Doctor. Their schooner was, I think, wrecked near the Exploring Isles in the eastern part of the group.

Commodore Goodenough, ably assisted by his industrious Navigating Officer, Lieutenant Hosken, is doing his best to improve our charts of this archipelago; but his praiseworthy efforts show only too clearly how much a surveying vessel is required in Melanesia.

Refreshing ourselves at Sydney, we next push northwards for Hong Kong; our course lies through portions of the ocean similar to those we have already passed; our charts of this part of the world may be said to be, in a great measure, supported by voluntary contributions. Captain Simpson and Navigating-Lieutenant Greet, in the "Blanche"; Navigating-Lieutenant Tilly, of the mission schooner "Southern Cross"; and lately Captain John Moresby and his navigator, Lieutenant Mourylian, have all sent additions to our charts. Captain Moresby has been very energetic on our behalf,—obtaining first the services of Navigating-Lieutenant Conner, of the Queensland Survey, and latterly those of Lieutenant Dawson, our itinerant surveyor of the south-western Pacific;—he has been enabled, through these Officers, to forward considerable information regarding the shores of New Guinea; following up the discoveries of Bougainville and Dentrecaesteaux, Captain Moresby has charted about 300 miles of the hitherto almost unknown western coast of this island, and has made important additions to the Admiralty charts. Notwithstanding, however, the

efforts of these worthy contributors, our captain's anxieties are not decreased, and it is not until we get to the northward of the Carolines that he can, for a season, divest himself of his boots.

Our passage is now more free from dangers. Passing through the Bashee Channel, we enter the China Seas, refreshing ourselves at Hong Kong. Leaving that port, we observe an absence of shade to the eastward, and traders between Hong Kong and Sydney would be grateful for better charts of the Mindoro Straits and the passages through the Philippine Islands. Coaling at Singapore, we hear that merchantmen are asking for better charts of the Carimata Strait and the Java Sea.

Entering the Indian Ocean, by the Straits of Malacca, our next port will be Point de Galle. I will here pause to thank Mr. Clements Markham for calling attention, in his Magazine of July last, to the state of the Coasts of India, little having been done to the charts of this important portion of our dominions since 1862, when the Indian Navy ceased to exist; and the charts, copper-plates, and original drawings were transferred to the Admiralty. Mr. Markham tells us "it was suggested, but not agreed to, that the future surveys of the "Indian Coasts should be conducted by the Royal Navy." The very few surveying ships that the Admiralty were allowed to equip had other work to do, the Imperial Treasury having no intention of paying for Indian surveys.

You will be pleased to hear that Lord Salisbury has here come to our assistance, and that a surveying force, consisting of five sailing vessels taken from the marine service at Bombay and Calcutta, will at once be established. Each sailing vessel will be supplied with a steam pinnace, and there will be one steam tender; the flotilla will be officered by one Staff-Commander, three Navigating-Lieutenants, two Navigating Sub-Lieutenants, with Mr. R. C. Carrington, late first-class draughtsman of the Hydrographic Department, as Chief Civil Assistant. This force has been organized by, and will be placed under the superintendence of a well-known Indian Officer, Commander A. D. Taylor, who will do his best to restore the efficiency of the old Indian Marine Surveys, and make provision for the fast-increasing commercial necessities of British India.

From Galle we proceed to Aden, and up the Red Sea. I regret being unable to mark the shores of this sea with the dark line. A beginning has, however, been made; Captain Nares has surveyed the Gulf of Suez, and Lieutenant Gray the small Strait of Bab-el-man-deb; but I have little doubt the trade through the Suez Canal will enforce this work. Thanks to Monsieur Lesseps, we need not leave our vessel, but may steam into the Mediterranean where, not to weary you farther, we will land at Brindisi and ruminate over what we have seen and heard. This voyage round the world will have given you an idea of how much is required to be done. We will next consider who there is to do it.

I fear if I pipe "Chart-makers to muster," there will hardly be sufficient for the work, especially if we look to the main line of the Navy, where only two Captains, one Commander, and two Lieutenants

can be found who may be called qualified to command surveying ships. The Retired Lists would add some four or five Officers to our forces, but I fear their services are no longer available. In addition to these Officers, there are nine Staff-Commanders and three Navigating-Lieutenants, who may also be in some measure qualified; for it must be remarked that, it having for some time past been considered expedient not to give Navigating Officers the command of surveying ships, they can be employed only as leaders of detached parties. Their instructions are to charter small craft in the colonies, and, with a hired crew and one or two assistants, work round the little circle of which their head-quarters is the centre.

This detached system chiefly recommends itself by its cheapness, and as an auxiliary force is, I admit, not without value; but it tends to isolate the Surveying Service from the general service, and naturally inclines the Officers connected with it, to feel *colonial* rather than *imperial* interests.

Another disadvantage of these detached parties is, that we lose that grand school for practical nautical surveying, viz., a ship and the disciplined life of a man-of-war, where alone a young Officer can acquire the combined knowledge requisite to qualify him for a profession in which the duties of the *sailor* can by no means be neglected. No man can expect to attain a trusted position as a Nautical Surveyor who is not essentially a good Officer and sailor, or, to speak more exactly, a good Pilot, knowing how to handle a body of men, the requirements of a ship, and the room she wants to wear, stay, or anchor in. This knowledge cannot be acquired in, what a naval paper has well termed, "the one-man-and-a-boy system" of nautical surveying.

It was with great regret, therefore, that, in the middle of 1873, men, like Sir Bartle Frere, who took an interest in this important branch of the Navy, saw it had fallen so low that there was only one regular surveying ship in commission, viz., the "Shearwater," under Commander Wharton, then on her passage from the survey of Sicily to assist in the Zanzibar expedition.

The "Challenger," Captain Nares, was, it is true, also in commission; but she must be looked upon rather as an exploring than as a surveying vessel; at the same time, under Captain Nares, and his indefatigable Chief of the Staff, Staff-Commander Tizard, a school was formed from which the best results may be expected.

The total number of Officers employed at this time, July, 1873, was, including the "Challenger's," 36, of whom four only belonged to the main branch of the service, *i.e.*, there were only one Captain, one Commander, and two Lieutenants among the number.

Let us now go back for a quarter of a century, to 1849, the days of Sir Francis Beaufort, when the public took a greater interest in the Surveying Service. We find that there were no fewer than 12 surveying vessels in *commission*, in addition to 23 Officers, borne on ships' books for detached Surveying Service.¹ At the same time the Arctic

¹ If in 1849 a full list of "Officers employed on surveying service" had been

force (the "Challenger" or additional scientific force of the period), numbered three ships, exclusive of the "Erebus" and "Terror."

I have here a list of Captains and Commanders, who in 1849 might have been considered qualified to have taken charge of a survey. The number is a large one, viz., 17 Captains and 12 Commanders: as the names are tolerably well known, I think reading the list will interest many of my hearers.

Captains.	Commanders.	Surveying Ships of 1849.
Barnett.	Bate.	"Acheron."
Bayfield.	Bedford.	"Avon."
Belcher.	Drury.	"Bramble."
Beechey.	Frazer.	"Columbia."
Bullock.	Orlebar.	"Comet."
Collinson.	Nolloth.	"Herald."
Denham.	Otter.	"Pandora."
FitzRoy.	Richards.	"Rattlesnake."
Graves.	Shortland.	"Royalist."
Kellett.	Spratt.	"Scorpion."
Owen.	Williams.	"Sparrow."
Sheringham.	Wolfe.	"Volage."
Stanley.		
Stokes.		
Sullivan.		
Vidal.		
Washington.		

It will be observed that I have given a list of Captains and Commanders only, omitting the Lieutenants and Masters employed in 1849; many of whom were also qualified to command surveying ships.

I have taken 1849 by chance. I am not sure that it was a year in which the Surveying Service was in a particularly flourishing state: 1873 was a bad year, the minimum was arrived at of *one ship*; a fact, cruel enough to arouse the shade of Sir Francis Beaufort; and it is easy to imagine that veteran Surveyor upbraiding his countrymen, and saying, with Cæsar Augustus, "Oh, Varus, restore me my legions."

I will next proceed to show that these ships of 1849, as schools, produced not only Nautical Surveyors, but superior Officers for the general service.

Take the "Acheron," commanded by Captain John Lort Stokes, then surveying New Zealand; in this same "Acheron," the late Hydrographer, Admiral G. H. Richards, was Commander, and Chief of the Staff; the present Hydrographer, Captain Evans, was the Master, and his present Chief Naval Assistant, Staff Commander Pender, a Master's Assistant.

The Captain of the "Encounter," Richard Bradshaw, the Officer at first especially selected to take the observers for the coming Transit of Venus, to Kerguelen Island, was also a Midshipman in the "Acheron."

given, similar to the one in the present Navy List, it would have included upwards of 80 names.

Take the "Herald," then, with the "Pandora," surveying the great Bight of Panama, under Captain Kellett and Lieutenant James Wood. The Captain of the "Herald" is now Sir Henry Kellett, K.C.B., lately Commander-in-Chief on the important China station.

I may here remark that the present Commander-in-Chief in China, Sir Charles Shadwell, K.C.B., Fellow of the Royal Society, was First Lieutenant of the "Fly," Captain Sir F. Blackwood, during the survey of the east coast of Australia and Torres Straits; while Admiral Ryder, the future Commander-in-Chief in China, received his early education as a sailor and navigator under Captain Richard Owen, in the "Thunder," the surveying ship in the West Indian station in 1833.

Returning to the "Herald," her First Lieutenant was Rochfort Maguire, who finished his career as Commodore of the Australian station. The Second Lieutenant commanded one of the Arctic ships in 1853. The Master of the "Herald," after leaving that ship, served as Master of Sir George Seymour's flagship in the West Indies. Of the Midshipmen, one died as Captain in charge of an Australian Survey, one has lately retired after commanding two surveying ships in succession; another is Captain Bedford Pim, who I am pleased to find on becoming M.P. has by no means ceased to be R.N., or forgotten his nine years' service in H.M. Surveying Service; and last and not least of the old "Herald's," is the humble individual who has the honour to address you, then a Master's Assistant, now Superintendent of Admiralty Charts.

I have taken two instances only out of the surveying vessels of 1849; I am sure that most of them would tell a similar tale. Sir John Glover, of Ashantee fame, was serving about that time as a Mate on board the "Volage," then surveying in the Mediterranean.

There is another interesting branch of the profession of Nautical Surveying, which becomes of the greatest value to our merchants in this age of submarine cables; I allude to deep sea soundings, and to an examination of the bed of the ocean for the purpose of laying those useful communicators. On the 1st of June last year, at a meeting of the Royal Geographical Society, the wall of the theatre of the London University was covered with diagrams, showing how much work the "Challenger" had done in deep-sea sounding. Great was Lord Howe's victory of the 1st of June, 1794 (a day never to be forgotten by the English sailor), and the memory of the day was well kept in 1874, by exhibiting the trophies of a victory over the elements of which Captain Nares may no less be proud. By the diagrams Dr. Carpenter illustrated an instructive paper, and I believe, proved the correctness of some of his ingenious theories.

Many of you know the care, forethought, and experience required in "overcoming the mechanical difficulties" of obtaining an accurate deep-sea sounding. Sounding was ever a most important point in a sailor's profession. Upon the accuracy of the soundings engraved on the Admiralty chart, the character of the Nautical Surveyor mainly

¹ A phrase used by some of our philosophers, who, although knowing a few of the secrets, cannot be said to comprehend the mystery of the sea.

depends, for while the land work may be done by the soldier or civil engineer, the sounding is the sailor's portion, requiring all the ready wit and tact of his profession. In sounding, the sailor has to manage air and water, the rise and fall of the tides, the velocity of currents, and to fit in his work to suit wind and weather; these forces becoming firm allies to the man who studies them, and foes only to him who knows not how to use them.

Readers of Marryat will remember the Master of the old war time was often called "Soundings" by his shipmates. The name might not have been meant as a compliment, but it nevertheless was so. This prime duty of a Nautical Surveyor is now of more value than ever. Telegraphic Engineers not only require accurate position and depth of water, but also samples of the bottom of the sea at great depths, they want to know what kind of bed their cables are to lie upon, and this information can be obtained only by sounding.

I am glad to observe that the part of Sir Bartle Frere's letter, showing the advantages of an expedition to the Arctic seas, has been attended to. The fact of our last Arctic Expeditions having brought to the front such men as McClure, McClintock, Maguire, Richards, Osborn, Armstrong, and Nares of the "Challenger," may lead us to hope that the present attempt to place the Union Jack on the northern meeting of the meridians, may bring into notice another body of English sailors, who shall worthily fill the place of those now passing away, and I feel sure none will ever regret again raising the cry of "Northward Ho!"

But there is one more point I should like to call your attention to, and that is to another body of men the Surveying Service has brought into notice; a class that many (and probably with good reason) would esteem more highly than the simple sailor; I allude to naturalists and botanists; and when I assert that such men as Darwin, Hooker, and Huxley, began their celebrated careers in Her Majesty's surveying and exploring vessels, I hope the public will think it worth while to restore the old practice of appointing a naturalist to surveying ships, on the chance of securing men of such undoubted value to the scientific world.

Professor Wyville Thomson's staff, now qualifying themselves for these important duties by sea service in Her Majesty's ship "Challenger," leads us to hope that the surveying vessels of the future will carry a naturalist, as in the days of Sir Francis Beaufort; and I was much pleased to observe in Captain Taylor's scheme for re-establishing the Indian surveys, that he pointed out the advisability of again appointing to every surveying vessel a Medical Officer, who is also a naturalist, and giving him encouragement and opportunity to pursue his scientific tastes.

I trust, Sir, that I have now fully proved the correctness of the assertions of Sir Bartle Frere, in his letter to Mr. Gladstone, viz.: "That there are few better schools than a Surveying ship; and that if such ships were multiplied, not only would commerce benefit, but our men-of-war would be better supplied with practical seamen."

We have now considered what may be termed the out-door work of the Surveying Service. We must next turn to the in-door portion.

The harvest may be plentiful, the labourers hardworking and willing, the corn is cut and stored, but before we can use it for food, it must be threshed, ground, and made into bread. As with corn so it is with nautical surveying. The work comes home, it has then to be given to the world in the shape of Admiralty charts.

This distribution of knowledge is placed in the hands of the Hydrographic Office of the Admiralty, which unfortunately, through the rigorous system of economy insisted upon by the public, has not been permitted to advance with the times.

The number of charts increases yearly, the work required is more finished and elaborate, the demand and sale of the charts also increases, but there is no corresponding increase in the Staff employed. In the beginning of 1874 the Office suffered two considerable losses, the late Hydrographer, Admiral Richards, being carried off to the chair of the Telegraph Maintenance Company; while the Japanese Government induced one of our best draughtsmen (holding through the present rules of the Civil Service, with regard to age, a junior appointment, but who had actually served four years in the Scottish Survey, and ten years at the Hydrographic Office), to leave £150 per annum in England for £1,000 per annum in Japan. At the end of the year, we also lost our first class draughtsman, whom Captain Taylor persuaded to join the Indian Marine Survey; as, however, this loss to us will be gain to India, we can console ourselves by knowing that Mr. Carrington is only serving the Indian instead of the Imperial Government.

Without entering into the general work of the Hydrographic Office, I will venture to make a few remarks upon the particular and important branch of the Department over which I have the honour to preside.

The old surveyors, who are present, will, I think, quite understand the mingled feelings of pride and diffidence which I experienced last year when (on the death of my much lamented predecessor, Captain Hoskyn, who may fairly be said to have died at his post) Admiral Richards placed me as Superintendent of Admiralty Charts in the chair once occupied by Michael Walker. The difficulties before me were not so much to improve the present, as to be equal to the past.

I found myself most ably supported by the gentlemen of the Admiralty Chart-Room, or room in which the charts are prepared for publication; but until I had fairly entered upon my new duties, I had failed to realize the maximum of work which this branch of the Office had managed to perform, with a minimum of hands.

An inspection of the Admiralty Chart-Room would prove the truth of the assertion of the *Daily News* in January, 1873, that "space is wanted" to spread out a chart, without having first to remove books or papers "that are at the same time under consideration." The place is rather suggestive of a midshipman's chest, and it is only from a sailor's luck of having been educated in a midshipman's berth and used in thus

"being cabined, cribbed, confined," to utilize every atom of space, that one is able to cope with this difficulty.

The number of charts at present published by the Admiralty is in round numbers 2,500, a large number of which are continually under correction, for changes in lights and buoys, alterations in leading marks, *i.e.*, beacons, natural or artificial, that lead through channels to clear submarine dangers.

These corrections, although small, require the greatest care and experience to make them; for if such *important simplicities* are neglected, and the chart be incorrect in these essentials, no finish or cunning engraving can save its credit; it is beauty without discretion, a danger "instead of a safeguard to the sailor who uses it. "Any draughtsman," says Sir Edward Belcher, "can make a neat showy plan, but it is useless if it cannot stand the seamen's test." As a very slight error in the position, colour, and character of a light or buoy, or in the insertion of a simple dot, cross, or figure may lead to the gravest disasters, every mark upon an Admiralty chart must be delineated by the Hydrographic Draughtsmen with the greatest care, and no pains are spared by these gentlemen in their endeavour to attain—where it is possible—mathematical exactness, and to lay before the public the labours of the nautical surveyors, explorers, and amateurs, not only of England, but of the civilized world; reducing their various styles into a comprehensive system, and thus furnishing the intelligent seamen with an intelligent guide, which common industry will soon enable him to thoroughly appreciate.

For instance, there are no fewer than 3,710 lighthouses and light-vessels in the world; these lighthouses and light-vessels are generally surrounded by, what we will term for illustration, a large family of buoys. Let us take a well-known place, "the Downs," or speaking of watering-places, that part of the coast of England between Broadstairs and Dover. Here we have 3 lighthouses, 4 light-vessels, and about 20 buoys, or nearly 3 buoys to one light; from this we may premise that there are considerably over 9,000 buoys that have to be inserted upon the Admiralty charts.

Notices of changes in lights and buoys abroad require careful translation by some one who not only understands the language, but also the subject under consideration. Here we miss the talented draughtsman before-mentioned, who, in addition to his other qualifications, was also a surveyor and an accomplished linguist.

Again, copper plates, when much used, actually wear out; 4,000 impressions taken from the same plate in four years is a trial even for copper. On an average, it may be stated that, allowing for each plate the constitutional three score and ten years, no less a number than 36 plates a year have to be re-drawn and re-engraved to keep up the stock. In addition to the above, new surveys require new plates; these average from 40 to 50 a year, making a total of about 80 fresh plates that are required yearly.

Sir Bartle Frere's address of 1874 informed the Royal Geographical Society that during the past year 77 new charts had been engraved and published; 1,620 sheets had received corrections and additions; and

the number of charts printed for the Royal and Mercantile Navies and use of the world had been 187,248.

All MSS. and published hydrographic matter received from foreign Governments has to be examined and compared with the published charts, to see if they can be improved therefrom; and in this duty alone considerable labour and experience are required.

The above constitutes an amount of work which the present staff of a chief draughtsman and five assistants, is not equal to, and the result is, that the unpublished information is steadily accumulating.

It may now be asked, "But what will the new College at Greenwich do for us?" This question will, I am sure, be answered to your satisfaction this day fortnight, when my friend Mr. Laughton will read us a paper on the outline of the studies at the Royal Naval College. My own experience, as an Examiner in Nautical Surveying at the College, encourages me to hope that it will recollect that it is educating men who are to be sailors themselves, and direct the labours of other sailors. Greenwich cannot educate the whole Navy, it can but select those Officers best fitted to make use of the advantages it offers. In those men, the College aims at developing the keenest intellectual insight, readiness, and strength, *but*—and there is as much virtue in this *but* as in Touchstone's *if*—*but* I say not (in the case of Surveyors) at the expense of their fingers.

Charts have to be projected or built. Our Surveyors will do this more craftily and swiftly, and with more delicacy and precision, with the help of higher mathematics; but a wilderness of $x + y$ will not assist a man who cannot use scale and compasses. Greenwich, therefore, while aiming at the highest, forgets not the lowest.

Emerson, commenting on the success of Napoleon, points out in how great a degree it was due, to his never thinking the smallest detail unworthy of the most careful consideration; he could draw up an attractive A B C for the King of Rome, as well as the orders for a score of brigades. "It is a five minutes," said the Emperor, "that wins a battle."

Darwin, himself a sailor, somewhere remarks that, as a man's intellect increases, his instinct decreases. Sailors must not be educated so highly that they lose those instincts which are the real cause of our naval supremacy. Remember that the success of the sailor and pilot depends upon a thorough and *ready* knowledge of the many important simplicities of his calling; such knowledge necessarily endows him with that promptness in action, and fearlessness in conduct, for which members of his profession have ever been distinguished.

The public must remember that while the Greenwich students are acquiring the valuable power of handling books and instruments, they should not lose the not merely valuable, but absolutely invaluable power of handling men and ships. Modern theorists seem to have forgotten that the great use of education is to enable man or woman to earn their living honestly in that station on board the ship of life, unto which the Great Commander-in-Chief has seen fit to call them. A sailor's education, more than any other, requires *time*. The late Head

Master of Rugby, and present Bishop of Exeter, Dr. Temple, speaking with large experience as a schoolmaster, remarks, "that the indispensable condition of success in self-culture is *time*"; but it is just this condition which is most signally wanting in modern education. The student of our day must almost of necessity acquire knowledge in a hurry, bolt it in fact (a bad process for mind as for body). He must learn much, not in order to retain it and make it (to again quote the Bishop) "part of his understanding," but in order that he may be able to throw it up, when under the ordeal of the examination room.

The College will furnish the understanding of its students with arms, but its labours will be thrown away unless the country gives the students a ship in which they can exercise those arms. The knowledge acquired at Greenwich is a force to be used at sea.

You have Greenwich ashore; to complete the business you must have Greenwich afloat. No occasion to build a ship; there are plenty at hand; take a vessel like the "Endymion," remove a few guns to give space for a chart room; call her the "Greenwich," and send her to sea with her seniors drawn from the College, her youngsters from the "Britannia" (possibly it might be advisable to send the youngsters to the "Greenwich" before the "Britannia").

Let her be commanded by some general service man, in whom might be found the united qualifications of sailor, navigator, and gunner, with a staff composed of a known Nautical Surveyor, and two assistants. Send her to work at some blank portion of the Unsurveyed World, say—the Pacific. The Fiji or Sandwich Islands will form a healthy field for her labours, the passage out affording time for the usual drills, for, as before remarked, the duties of the sailor and gunner must by no means be neglected. Under the good Providence she would return in some five years time, not only with a cargo of charts, but with men, who in becoming professors had not ceased to be sailors. For it is in ships only that men can discover the "Secrets of the sea," and it is not with an egotistical, but with a self-reliant spirit that I quote Longfellow, and maintain, when speaking of the sea, that—

"Only those who brave its dangers
Comprehend its mystery!"¹

"Ships for sailors" must be the cry of our New Greenwich. Let us learn from a well-known character, Mr. Wackford Squeers, of Do-the-Boy's Hall, who, when he had taught a boy to spell "window" after his own peculiar fashion, viz., "w-i-n, win; d-e-r, der; winder," at once dispatched him to go and clean it, this he termed the "practical" mode of teaching, the regular education system."

Do not, therefore, fall astern of Do-the-Boy's Hall, but when your sailors have learnt the theory of Nautical Surveying, give them a well-

¹ *Specimen of the Ideas of Men who do not Comprehend its Mystery: cut from a weekly paper.*

"A suggestion is made to establish telegraph cable stations on the high seas, "built upon buoys, at which a steamer may stop and communicate if in "distress, give in her time, and enable her passengers to communicate with their "friends on either shore."

found, and well-manned, man-of-war to go and practise it, by making charts of some portion of the Unsurveyed World.

I have thus endeavoured, in the best language I can command, to set before you the present wants not only of Her Majesty's Surveying Service, but of the mercantile world, and ask you to bestow upon this service a little care, attention, and money you give so freely to ship-building and experiments therein, and great gun-founding; for let ships and guns be perfection, they are useless unless you have skilled men and trustworthy charts, to conduct your floating castles with confidence and security.

In conclusion, I appeal to many in this theatre who are fortunate enough to possess the ear of the public, and beg of them, if this paper has found favour in their sight, to assist in establishing, on its proper footing, a service not alone useful in peace, but also terrible in war. The old Napoleon's collection of maps was probably the best then in existence; with these and his compasses he planned the destruction of the Austrian forces, and what he had warily conceived in the Tuileries, he executed in the field with the celerity and force of a thunderbolt. Similarly, the success of Naval operations often depends upon the correctness of the charts, coupled with the power the sailor may possess of constructing and using them.

I would, therefore, call attention to the necessity of giving Naval Officers early opportunities of putting into practice afloat what they have learned on shore; doing, it may be said, at Austerlitz what they have planned in Paris.

Finally, I entreat you all to let this branch of Her Majesty's Service be so well recognized, as a useful element in the Empire, that it shall be in some measure protected from those blasts of ruinous economy which periodically sweep over our country; remembering that, from its first establishment, the Surveying Service has been "*second to none*" in placing and maintaining the Navy of Great Britain in its prominent position among the forces of civilization.

The CHAIRMAN: Before I call upon you to join with me in returning thanks, I have no doubt there are many gentlemen here who would like to make some observations upon the interesting paper we have just heard. Captain Shortland, I believe, is present.

Captain SHORTLAND, R.N.: Our lecturer has said what he has to say so extremely well that there is very little to be added. We surveyors know the difficulties that Officers, who are called upon to survey, have to contend with. They do not generally have the best ships given them, nor are their labours so well understood by those who have not followed surveying as by those who have, like our worthy chairman and myself perhaps. We know that we have fallen very much behind-hand lately in the numbers that have been employed, and the encouragement given to us has not been very great as far as my experience goes. I hope that the people in power, taking up our worthy lecturer's paper, will carry out some of his views and bestow a little more attention to a subject that so well deserves their best consideration. I quite believe that surveying ought not to be *departmental*, but it ought to be considered *national*. It concerns the whole nation that we should have good charts, especially as our commerce is so very large and is extending every day. If our merchants understood that, it would be the best mode of lessening the insurance on their ships, and I do hope this will be understood in order that the House of Commons may be impressed with the necessity of expending a little more money on works which are

so useful and essential. However, all I have said is so obvious to everyone, that it is hardly necessary for me to say it.

Lieutenant STIFFE, late Indian Navy : I wish, in the first place, to bear testimony to the great ability and knowledge of the subject shown by Captain Hull, and to the trouble he must have taken in getting up that chart. I think, also, the thanks of the public are, due to him for drawing attention to the very important subject of the deficient state of our knowledge. For several reasons, lately, hydrography has been at a discount, and it has really seemed to me that the race of hydrographic surveyors was going to become extinct altogether. The chief countries that have had to do with hydrography have been England, France, and America. Since the civil war in America, there has been very little done there. In France there has been also a collapse during the last few years, owing to the war; and, in England, although the difficulties have only been financial, yet that has apparently been as effectual as any other cause, and we have come down it seems, at one time, to one surveying ship, which is rather an unpleasant state of things to contemplate. I would also mention the abolition of the Indian Navy, to which I had the honour to belong, and the dispersion of the trained group of men that belonged to the surveying branch of that service, has also added to the deficiency. We may hope a new era is going to dawn now, and that a House of Commons, more liberal in the true sense, will see the propriety of taking a fresh start in this matter, and enabling England to maintain her proud position at the head of nautical affairs, and rule the deep with lines of soundings in addition to other methods. Of course, unless the public can be got to understand, clearly, and take an interest in the subject, which can only be done in some such way as drawing up such a map as this, it is hopeless to expect any improvement in the matter. I have no doubt many outsiders, on looking at this map, will be rather astonished to see so much *brown* in the map.¹ Doubtless they may have formed an idea that all our maps and charts were models of perfection and completeness, and that everything in print must be correct; and, therefore, they will be surprised that so much remains to be done. But I must confess that on looking at it, to me it is perfectly astonishing there is so much *red* there; when one thinks that hydrography and charts on the present system are a thing people now living can almost recollect the beginning of. The last half century, I suppose, is nearly the whole period, and when one thinks what an expenditure of time, energy, labour, money, and life, even one of our charts often represents, it is perfectly astonishing that so much has been done. The field is obviously very large, and I have no doubt when we have finished the *brown* that is shown there, we shall have to begin again, for the increasing demands of hydrography will necessitate new and more elaborate surveys.

There is one subject Captain Hull has felt obliged to treat very tenderly, namely, the indoor department of the Hydrographic Office. We know it is difficult for a man to complain of the shoe that pinches himself, and it is not much liked. Perhaps an outsider may say something plainer, and I will say that I think the amount of space allotted to the Hydrographic Department of the Admiralty is utterly inadequate to the demand, and is unworthy of a country like this. I must say the first time I went there, 12 or 14 years ago, and was shown into the Chart-Room, I came to the conclusion that there must be suites of rooms, elsewhere, that were not shown to the public, and certainly began to institute a comparison with a private civil engineer's drafting office near Great George Street, where I was then employed, not at all to the advantage of the Admiralty Chart-Room. I must say, how the gentlemen in that department manage to find anything, spread it out for use, or put it away again, is quite a puzzle to me. It must be the result of bringing up from childhood in that office, or I do not see how it is to be done. I think it must be admitted that a large increase in the staff is a *sine quâ non*. There are, Captain Hull states, about 2,500 charts now in use; I should like to know what the percentage of increase is on what the number was 10 or 20 years ago, and what is the comparative increase of the staff to work these charts. When one thinks that the charts of the whole world are manipu-

¹ On the chart exhibited at the lecture, those parts of the world that had only been explored were coloured *brown*; the fairly surveyed portions were coloured *red*; and the partially surveyed, *blue*.

lated and repaired in that small room, it is marvellous how the work is got through at all.

Mr. FORDE: I had hoped I should have been allowed to listen to this interesting paper and discussion without having to speak myself, as I am not very much given to it; but I assure you, being connected very much as I am with submarine telegraphs all over the world, I have listened to this paper with the greatest pleasure, and I hope the result of it will be good for us engineers. We are often called upon to lay cables from one part of the world to another almost at a moment's notice, and the first thing we have to do is to rush off to the Hydrographer's Department to know what information they have as regards the locality in question. In 1861 I was engineer to Her Majesty's Government for a line laid from Malta to Alexandria. Admiral Washington was, at that time, Hydrographer to the Admiralty, and we got the charts from him. They looked exceedingly nice; and, as Admiralty charts usually are, very correct, we had come to the conclusion that we should lay this cable along the coast so as to have it within reasonable depths, as some of the former cables had been lost in deep water. We found, as I have just said, the charts exceedingly pretty, and we imagined that they were very carefully done. I was asked by the Board of Trade to write out instructions for the Hydrographer's Department to have soundings taken, in order to make quite sure of the depths and nature of the bottom, and in order to obtain soundings at much closer intervals than what is usual on Admiralty charts. The Admiralty undertook to make these soundings, and we waited some time for them. I then waited on Admiral Washington and asked him, "Have not you some soundings for us?" He said "Yes, we have" some, but the information is so incorrect, I dare not send it to you." He sent out orders, in the first instance, to Commander Mansell of the "Firefly," then stationed at Alexandria, and he said his soundings were so incorrect, or, at all events, they disagreed so with published charts, that he had telegraphed to Captain Spratt, commanding Her Majesty's ship "Medina," to go and take these soundings. In due course, Captain Spratt sent home his first soundings, when Admiral Washington informed us that they confirmed those of Commander Mansell, and disagreed entirely with the published charts of that coast; in fact Captain Spratt found great discrepancies. Where the charts represented the soundings to deepen gradually from the coast into the Mediterranean, Captain Spratt found they were more like steps of stairs, going down 100 fathoms in the swing of a ship. He spent some time over this, and took partial soundings along the coast from Alexandria to Tripoli, and thence to Malta. I went to Malta to see him, and he told me he had finished that service of four soundings. On examining the charts I told him I wanted a great many more soundings, to which he replied that my request could not be complied with, as he had already burnt too much of Her Majesty's coals in the service of the Company; but when it was explained to him that this was a Government cable, he then saw the propriety of burning more coal, and started off again for the coast, and continued his work for several months longer. It appears to me that the blue colour, on the diagram, is due to Captain Spratt's services on this occasion. One thing occurred to me at that time, and I happened to mention it to the Commander-in-Chief at Malta (Admiral Sir William Martin), and that was seeing there were so many of Her Majesty's ships sailing all over the world, why cannot it be managed to have a sounding taken by each ship at noon; and, in that way, we should soon see the whole globe covered with valuable soundings; which soundings would be more or less a guide to engineers who have to carry out these long cables through deep water. But his answer to that was, "a deep-sea sounding, as we all know, requires to be" taken by a man who has had great experience in the matter, and who has been well "trained to it, otherwise you get false results." Now Captain Hull's paper clearly shows that the nursery for bringing up Officers to surveying has almost been destroyed, therefore we are not likely to have Officers, on board each man-of-war, that are trained to surveying and taking deep-sea soundings. I think, myself, each man-of-war ought to carry an Officer who has been trained in the Surveying Service, just as they would a gunnery-lieutenant. I only hope that this paper may not only be brought to the notice of the Lords of the Admiralty, but that they should, if possible, read, mark, learn, and inwardly digest it, with a view to their carrying into effect Captain Hull's valuable suggestions. The "Challenger,"

no doubt, is doing good service, and will give us a great amount of valuable information both as to the deep-sea soundings and currents, as well as the nature of the bottom. I will only add that this paper is particularly interesting to us as civil engineers engaged in laying cables, and I for one, heartily thank Captain Hull for bringing the subject forward.

Mr. LAUGHTON: I have taken such great interest in the subject of surveying for some time past, that it was with great gratification I learned that Captain Hull was going to bring it forward; it is one to whose needs I am quite sure the country is not awake. If a copy of the chart now before us could in any way be published, as in the fly-sheet of the "Times," the country would be aghast. People look at the beautiful maps issued by Keith Johnstone, and others, and they think that we know the world perfectly: what more can be wanted? They do not know that the outlines given on such maps are to a great extent mere guess-work; the proportion of what is real knowledge and of what is imagination is not known even by well educated men. I most sincerely hope the Government may be able to take the matter up, and that Parliament may find them the means to do so. In our small way at Greenwich I think we shall, in course of time, be able to give a foundation. It is not much we can do with such an entirely practical subject as surveying; but still we can give them the A B C of it, and that we are doing,—I believe, very effectually.

Dr. HIRST, F.R.S.: It was not my intention, Sir, to make any remarks this evening, because I really did not expect to be able to attend your meeting. I have listened with very great pleasure to the paper just read by Captain Hull, and I have naturally been greatly interested in the allusions he has made to the part which Greenwich may play in improving the Surveying Service of the country. There is, I think, but one observation in Captain Hull's address with which I do not heartily concur. His warning against our educating Naval Officers at Greenwich is, I submit, scarcely called for at present. If you take into consideration the small amount of an Officer's time which, under the most favourable circumstances, can be passed at Greenwich, you will, I think, admit—Mr. Darwin would certainly do so—that his sailor instincts are in little danger of being thereby diminished by over-education. Moreover, if you had been in my position this afternoon, Sir, and had seen Captain Johnson's class operating with their sextants and other instruments within the railings of Greenwich College, fixing the positions of gravel walks, by means of angles subtended by lamp-posts: if you had seen these Officers afterwards in their class-rooms laying down said walks and lamp-posts on paper, constructing, in fact, a chart with as great care as if the safety of their instructors, when traversing the Quadrangle on a foggy day, depended upon the accuracy of their work; if you had seen this, I say, you would agree with me that at Greenwich we do not at all neglect those simplicities of a surveyor's work to which Captain Hull has very properly directed attention. We certainly do not attempt to rival "Mr. Squeers" in his mode of imparting a practical training. We do not fall astern of him, however, in the matter of window-spelling, but we look mainly to the Admiralty to provide opportunities for window-cleaning. I believe, Sir, that the studies pursued at Greenwich are without exception those with which every practical man, properly so called, ought to be thoroughly acquainted. I believe that without the intellectual and theoretical training which we endeavour to give, the action of a practical man would be incessantly hampered, and not unfrequently misdirected. I have, therefore, no hesitation in pronouncing all fears as to the character and tendency of the studies pursued by Naval Officers at Greenwich to be perfectly groundless. At the same time, however, I entirely concur with Captain Hull in the opinion that our work at Greenwich requires supplementing in the manner he has advocated. Operations conducted in the Quadrangle, and even extended by means of the "Arrow" and our steam launch to a short distance down the Thames are, of course, insufficient to make a surveyor. To this end the wider experiences which a surveying ship alone can provide are absolutely indispensable. The praiseworthy efforts of our students to master the rudiments of Nautical Surveying at Greenwich, deserve more recognition by the Admiralty than they have as yet received. Such recognition, in the form of speedy employment in surveying ships, would not only be of great service to the College, but would be welcomed by all who are interested in the welfare of our

Surveying Service. We have no less than forty Officers, including Captains, Commanders, Lieutenants, and Navigating Lieutenants, now studying Nautical Surveying under the guidance of Captain Johnson. Last Session we had about twenty such students, and Captain Hull, who was their Examiner last June, was able to report very favourably of their proficiency. At the head of the list stood Commander Grey, an Officer who has well qualified himself for surveying duties, and who will, I trust, soon be actively employed in such. In conclusion, Sir, I may state that I cordially join in the wish, to which expression has been so frequently given this evening, that the Admiralty may be induced speedily to raise our Surveying Service to the high rank it formerly held.

CLEMENTS MARKHAM, Esq., C.B., F.R.S.: I, like the rest of the company, have listened with very great interest to Captain Hull's suggestive paper. I cannot help feeling that it may prove to be a turning point; that there is reason to think, from various causes, that the surveying branch of the Naval Service has at last reached its lowest depression, and it certainly will be a very great satisfaction to Captain Hull if hereafter, from this year, perhaps from this evening, we may date the gradual increase of the efficiency of the Surveying Service of the Navy of this country. In the meanwhile other countries are doing a little here and there: and I should like to be allowed to ask, if it is not an improper question, whether, whilst we are neglecting the work that used to be done on a much larger scale twenty years ago, there is any regular system of collecting from other countries all the surveying work which is done, sometimes good and sometimes indifferent, in small patches and in numerous parts of the world. This kind of work occasionally comes to my knowledge, and I have often wondered whether, as a matter of course and regularity, it was received at the Hydrographer's Office. For there is what appeared to me a beautiful little survey of the intricate channels between the Island of Chiloe and the main land. I know of another survey on the coast of Peru, executed the other day. It seems to me that increasingly valuable additions may be made to the charts, by carefully collecting everything that is done by other countries. I see, with some surprise, the whole of the West Coast of South America coloured brown. I fancied that the chart-sheets of that coast were prepared by Admiral Fitzroy, and that it would have received a blue colour. If this is not so, I can conceive no more important work than the completion of the whole of that West Coast by a regular survey, for nearly every small part on it is visited by English steamers. There was one lost only the other day to the north of Callao. Certainly numerous anchorages and bays, which no one would ever have dreamed of entering thirty years ago, are now constantly used owing to the increasing trade in sugar, cotton, and other exports of Peru. I remember myself taking a small vessel into one of the ports of which there was no sign in the chart. There is another part of the chart that shows, I think, too much red, which I think should be reduced. India has no right to have the red completely round her shores, because there are several little bits here and there unconnected, and there ought to have been brown spots in at least three places. A very distinguished civil servant of India recently told me he had, near Cape Comorin, himself opened a cotton port and despatched a ship direct to England from a place entirely unsurveyed, and unknown as an anchorage. I should like very much to see Captain Hull's chart reproduced in large numbers, because very few people can have an idea of the immense tract of coast that is untouched. I certainly had not. I fancied I should have seen the whole of that coast of South America, as examined by Fitzroy, in red; but I only see patches here and there. I am sure we ought to be extremely obliged to Captain Hull for the information he has imparted to us.

Captain DAVIS, R.N.: As an old surveyor myself, and having been employed on the survey of the coast of Peru, under the late Admiral Fitzroy, I can quite understand why Captain Hull has fixed a brown mark round that portion of the coast that I was engaged on. I consider the survey made of that part of the coast by Admiral Fitzroy to have been nothing more than a pilot-survey—a survey of the greatest utility in his day, when such ports as Mr. Markham has instanced were not even thought of as being of any importance. Admiral Fitzroy pointed them all out in a simple running survey, so that I would not at all make the assertion that the

whole of that coast was properly surveyed. Still, I think Captain Hull might put in a little bit more red.

MR. TRELAWNY SAUNDERS: I wish to add one word with reference to a practical consequence arising from the breaking up, or almost entire breaking up, of such an establishment as that which was carried on with great success under Admiral Beaufort, and that is the dispersion of a considerable body of trained artisans employed in the engraving of the charts. A body like that is not easily trained; it takes many years of apprenticeship to train them up to the execution of a work of such excellent character as those charts were; and I must say, when one compares the charts of the present day with the charts executed by Admiral Beaufort, I am afraid we must consider that there has been a decline in the art of engraving as represented by the Admiralty charts, rather than an advance. I am quite sure that whenever a very considerable increase may take place in the staff of surveyors, and there is an endeavour to turn to account the large stores of information that remain unused in the Admiralty, a very considerable difficulty will be found in procuring competent engravers, and that is one of the consequences of the economy that has been practised of recent years in the reduction of this important establishment. I think, Sir, before economies are practised in such a way as to disperse trained artisans, the consequences of such economies ought to be calculated and foreseen.

CAPTAIN HULL: With regard to the remark by Mr. Forde about the soundings not being found to agree in the Mediterranean, I may say, the soundings he alluded to were done in the days of Admiral Smyth, the great amount of coast explored being creditable to the Admiral, but it was, as Captain Davis has very well remarked, a pilot survey. I have no doubt the soundings of Captain Spratt and, I think, Captain Mansell, will be found to have the advantage of being taken by better trained men, who were able to devote more time to the work.

With regard to what Mr. Markham says of the coast from Callao, I think the work of Admiral Fitzroy's was of a similar character, and in going over it with the assistance of my friend Mr. Powell, the chief draughtsman, we came to the conclusion that, although we should have liked to colour it blue, *i.e.*, "partially surveyed," in justice we were obliged to make it brown, or "only explored."

I had not the least idea of making any attack on the Royal Naval College at Greenwich. I am quite certain the College is moving in the right direction. The remarks in my paper were rather directed towards the British public; I fancied from one or two remarks I had heard lately they were expecting too much from Greenwich; and, with regard to my allusion to Mr. Squeers, I brought him in as a sort of laugh at the public. If Greenwich taught its students to spell "window," or surveying ship, Greenwich could do no more. The public should then find the "window," or ship, to clean or survey in.

With regard to India, Mr. Markham said some part of India was not so well surveyed. I coloured that part of the chart with the assistance of Captain Taylor and Lieutenant Stiffe. Unfortunately I had never been in India myself, but I shall recollect Mr. Markham's remarks, and, when I prepare the chart for the Journal, I will take care that the part referred to shall be amended.

The Falkland Islands were done by Admiral Sullivan. They are very well surveyed, and I think are equal to the wants of the times.

As to the River Plate, portions of that river are surveyed, but they are unconnected. The river has never been fairly surveyed throughout.

THE CHAIRMAN: I am sure you will join with me in saying we have had a most interesting lecture, and before asking you to return thanks, I will just make one or two observations. We all are very well aware that the Battle of the Nile never could have been fought at the hour it was, if Nelson had not himself been a pilot. We are also well aware, at Copenhagen he took his own soundings; and, by being able to take his ships in to a close position to the batteries, compelled the result of the action there. I could quote several other Officers, Beaufort, for instance, who, in the course of the war, surveyed Karamania; Heywood, who surveyed the River Plate; but I will allude to one very celebrated Officer. A few years ago I had occasion to consult the charts of Spitzbergen at the Admiralty, and I came upon one, the last publication, corrected and improved by Captain Brook of the "Shannon." Now these are instances I have brought forward especially to call

the attention of the junior Officers, that a knowledge of surveying, in all probability, may materially influence their career through life.

I now would proceed in a few words to allude to the great benefit which the naval and mercantile service derived from the career of Admiral Sir Francis Beaufort as hydrographer. The magnitude of the ignorance was enormous, but, fortunately, we had a man who was equal to the occasion. Under his fostering care, the Officers in the list which was read to you to-night were educated and well brought up, looking to him for his countenance, advice, and support, and always being welcomed back by him with that kindness and affection which is the true source of confidence between employer and employed. I will just allude to these places which are now marked as you see them. My first passage round Cape Horn was in the month of March, fifty years ago, but then I had nothing to do with longitudes. In the year 1827 I arrived at Rio Janeiro with twelve chronometers on board the ship, and we fancied we had fixed the longitude. We returned in another vessel in the year 1835, and we were quietly informed that we were 14 miles in error. Afterwards we went round Cape Horn and tried to carry the longitude up into the Pacific. Our chronometers all went wrong, although we had twenty, and the fact of the matter was that the longitude of the West Coast of South America was not correctly fixed, I suppose, until steamers began to run in 1858. In the course of that voyage one of our objects was to settle the question of the longitude of Mount St. Elias. We sailed from Mazatlan, went up to Cook's Inlet, in lat. 60° N., and returned back to Mazatlan, although we had twenty chronometers, we brought our longitude back to 15 miles in error. That will give you an idea of the difficulty of ascertaining longitudes by chronometers, unless you perform voyages to and fro. In 1840 we found the Island of Chusan 30 miles out in longitude; and, having occasion in 1848, to compare the charts at the mouth of the Hooghly, I found the longitude of the entrance, to that river, 8 miles in error. That will give you an idea of the magnitude of the errors in those days, and what a great amount has been done since that period, and which we mainly owe to the persevering efforts of Sir Francis Beaufort. Captain Hull alluded to the survey in South America on which I was employed, and spoke about the difficulties with the rain, and told you a story about Dampier. I remember, under the same circumstances, Dampier says that it came on to rain; and, by great difficulty, they got some cocoa, but, for the life of them, they could not finish their cups, for it rained so fast.

I think now, Gentlemen, I may ask you to join with me in returning our thanks to Captain Hull for the interesting account that he has given to us, and I am sure you will cordially agree with me in thanking him for the able paper which he has written.

LECTURE.

-Friday, March 19, 1875.

COLONEL SIR WILLIAM F. DRUMMOND JERVOIS, C.B.,
K.C.M.G., R.E., in the Chair.

THE NEW WORKS FOR THE DEFENCE OF PARIS.

By Major E. S. TYLER, R.E.

THE siege of Paris by the Prussians in 1870-71 showed plainly the value of the fortifications round Paris. The German forces, after defeating the armies of France in the field, were stopped in the full tide of victory by the forts of the capital. It was, nevertheless, apparent from this siege, and also from the siege by the Government of France against the Commune, when M. Thiers by a singular stroke of destiny had to besiege the very fortifications he had been mainly instrumental in causing to be built, that the works were not capable of offering due resistance to rifled artillery.

Accordingly, as soon as the place was recaptured from the Communists, the Commandant of the Army of Paris was ordered to direct the engineers to prepare designs for new defences. After being considered by the Committee of Fortifications, the Commission of Defence, and the Army Committee of the National Assembly, a project for a new system of defences was finally adopted last year, and in the autumn the works were commenced.

The ground has been broken on the north and on the south of Paris, and the work is being pushed on vigorously in those quarters. On the east and the west designs have been matured. But as want of money prevents the whole of the work from being commenced at once, it has been determined to postpone for the present the execution of the works on the east and west sides, and to devote all the available resources to the new forts on the north and the south, which will cover the weakest points of the old defences.

The proposal to execute these works was not carried, however, without considerable opposition. There were people, as there always are in such circumstances, who objected to all defences as being likely to invite an attack, and attributed the fact of a siege having taken place to the existence of the fortifications. M. Viollet-le-Duc has expressed this idea very clearly. He says, "Paris fortifié est devenu l'objectif

"des Allemands." "The fortifications have rendered Paris the object of the Germans." Paris had, however, "become the object of the Germans" before the existing fortifications were built. The capital of France had no fortifications in 1814, or in 1815, but was nevertheless the object of the Allied Armies. In 1870 Berlin had no fortifications, but the cry of the French was "à Berlin." It is not the works of defence that surround Paris that make that city the object of the enemies of France. It is because Paris is the heart of the country, the centre of the finance and commerce of the nation, and the seat of government.

General Chabaud-la-Tour, the author of the report of the Commission de l'Armée, to which I am indebted for much of the substance of this lecture, replied to the objections to the fortifications of Paris in the Assembly. He said, "The illustrious Lamartine in attacking in 1841 the project for fortifying Paris used these words—'We are showing the enemy the point where he can best strike France.' We replied at that time, that after the events of 1814 and 1815 we need have no fear that we could teach the enemy anything in this respect; that history was a more dangerous instructor to him than the demand to fortify Paris; that we wished to discourage any enterprise of the enemy against our capital, because the fact, that Paris was in a condition to resist his attacks, would have a powerful influence on the defence of the country; that we did not wish to attract the enemy to the capital, but to keep him away from it."

"Our object," said General Chabaud-la-Tour, "is the same to-day. We wish, by remedying the defects of our fortifications, to deprive the enemy of the hope that he may reduce our capital, as in 1871."

The French have indeed abundance of experience to warn them that, as Paris is the centre of all their warlike operations, so is it the point which is most exposed to the attacks of an enemy. Towards Paris converge the valleys which descend from the eastern and northern frontiers to the heart of France. Three times during the present century have invading armies descended those valleys. In 1814, the Grand Army under Schwartzberg, after overrunning the south-eastern provinces of France, advanced to Paris down the valley of the Seine, and the Prussians under Blücher descended the valley of the Marne. In the following year the Allies under Wellington came from Belgium down the valley of the Oise. Again, in 1870, the Prussians followed the same route along the Marne that had been traversed by Blücher in 1814. If in any future war the armies of France should meet with ill-success in the field, their enemies' forces will traverse once more the well-beaten tracks that lead to the capital, since they well know that victory over the nation is never complete till Paris is taken.

And, since the last war the approach to Paris is much less difficult than it was before. Since the cession of Alsace and Lorraine, the distance to be traversed by an enemy from the north-eastern frontier has been reduced by nearly one-third, the frontier fortresses of Metz and Strasburg have become the bases of operation of the invader. It is true that new works are being constructed inside the restricted

frontier of 1871. New fortifications at Mezières and Verdun on the north, and a great quadrilateral at Epinal, Belfort, Besançon, and Langres on the east, will do much to strengthen the frontier. If, however, the field army be defeated, such fortresses may impede, but cannot stop a numerically strong invader in his advance on Paris.

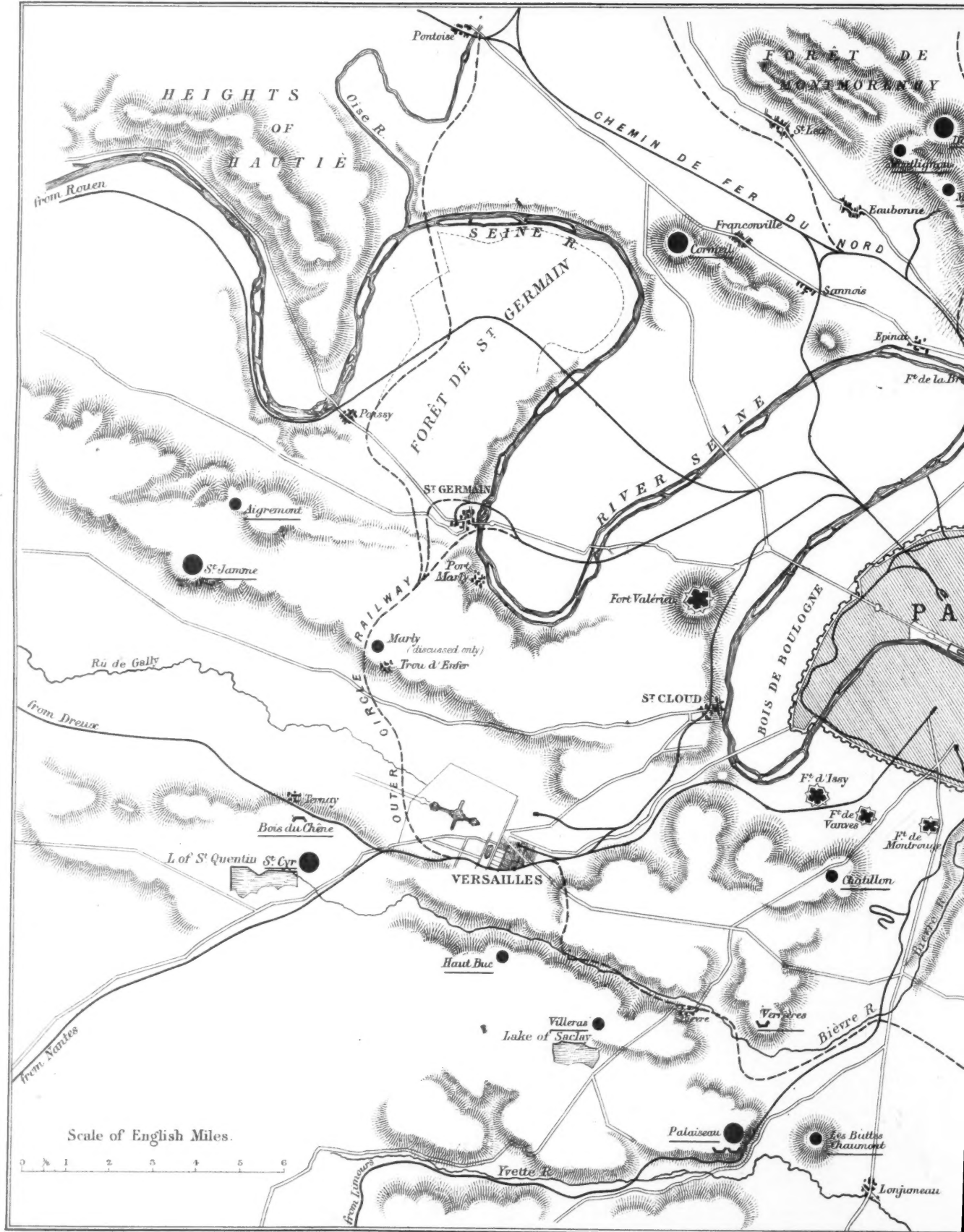
Though the fortifications of Paris did not succumb in the late siege, the incomplete attacks of the Germans demonstrated that the system of defence was not adapted to the conditions of modern warfare.

The advanced forts are so near the enceinte that they do not protect the city from bombardment. They are only 2,000 yards in front of the ramparts, so that the Prussian batteries on the heights to the south of Paris were able to throw shells into the portion of the city on the left bank of the Seine.

It is a remarkable fact, that even when these defences were projected, more than thirty years ago, one engineer raised serious objections to the position selected for the detached forts in the south. General Noizet warned the French Government that even with the limited range of the projectiles of that period Paris might, in spite of the detached forts, be set on fire from batteries on the heights of Chatillon, and he proposed to occupy those heights.

The old detached forts are so placed, that a sortie in force is a most difficult, and in some quarters an impracticable undertaking. On the north the ground outside St. Denis commands the defences of the place, and the investing army of the Germans in 1870, taking advantage of this formation of the ground, intrenched themselves so strongly, that an attack upon their lines could not be made with any hope of success. On the south the heights of Chatillon and Clamart command the forts, and are so clothed with woods and with houses, and so intersected with ravines and enclosures, that the movement of masses of troops is impossible. In the south-west the ground is so broken, that the investing force was able to construct almost unassailable lines of field works and obstacles. On the west and north-west, the windings of the Seine place equal restrictions on the movements of the garrison and of the attacking force. To the eastward a sortie was made with a large force on the 30th November, 1870. Five bridges were thrown across the Marne; 70,000 men were employed. The centre column of attack was directed on Champigny; but the difficulty of assembling large masses of troops, and getting them across the river, was very great; and though the French at one time had gained some advantage, they were eventually compelled to retire.

Moreover, from observatories on the commanding heights on the north and on the south, and also from some elevated points of ground elsewhere, the Prussians were able to watch the besieged so closely that no movement of any considerable body of troops could take place without the besiegers being aware of it. As soon as the garrison were seen to be massing their forces in any quarter, the Germans knew that a sortie might be expected, and were able to begin at once to collect their troops at the threatened parts of the investing lines. A German





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writer says, "The preparations for the sorties took place under our eyes, so that we were never unready."

The ground round the old works at Paris is, in fact, generally more favourable to the attack than the defence. Good positions for siege batteries abound on the heights of Clamart and Chatillon and on the high ground in front of St. Denis, and the ground in front of the fortifications is well adapted for a blockading force to entrench themselves. Owing to this conformation of the ground the Prussians were able to construct and to guard with success their lines of investment, and it was almost impossible for the French to break through them. Without studying this ground, and the accounts of the singularly complete system of fieldworks and obstacles which the Prussians constructed upon it, it is difficult to understand the want of success of the French in their sorties, or the difficulties which the French encountered in their attempts to break through the lines which surrounded them.

The merits and defects of the defences constructed according to the project of 1840 may be thus summed up:—

- 1st. They stopped the Prussians.
- 2nd. They did not save the city from bombardment.
- 3rd. They did not afford facilities to the garrison to make effective sorties.

The central and most important point of the existing defences on the north of Paris is the populous town of St. Denis, two or three miles outside the enceinte of the place. In front of St. Denis are some bastioned lines of good profile, but without casemated cover, called La Double Couronne du Nord. To the left of the crownwork is a small enclosed work, the Fort de la Briche, lying close to the Seine. To the right of the crownwork is the Fort de l'Est, also a closed work of small dimensions. All these works are capable of resisting an assault, but they are not fit to withstand a serious attack. The exterior defences of the north of Paris are completed by the large Fort of Aubervilliers, which is on the flat ground to the right of the Fort de l'Est, and connects the defences of the north with the forts of the plateau of Montreuil, which guard Paris on the east.

Northward of the lines of La Double Couronne the ground rises continuously for miles. The besieger can and did post his batteries within range of the works, on ground higher than the works themselves. The siege batteries of the Prussians opened fire so short a time before famine compelled the French to surrender that the attack of the besiegers was never carried on beyond the stage of preliminary bombardment, but the French, conscious of the weakness of these defences, seem to have attached more importance to the northern attack than the Prussians did. The Commission of the Army say, with truth, in their report, that "St. Denis, with its incomplete defences, its double crownwork without bomb-proofs, and commanded on all sides, is not at present in a condition to make much resistance. The enemy, who was able during the late war to bombard the works above enumerated, might have established himself on the heights

"that command the place, and thence after subduing the fire of the works have pushed on his attack over ground most favourable to his operations, till he gained possession of St. Denis. This done some of the most populous quarters of the city would have been within range of his position, and might have been set on fire by his projectiles."

A good position farther to the front is not to be found very near to St. Denis, for the ground continually rises for some miles in front of La Double Couronne, and it is necessary to travel five miles along the main road to Calais and Amiens, before the summit of the high ground is reached. On the left of the road at this distance is a range of heights, and at the highest point of this range the Fort of Domont, a large work of the first class, is being constructed. The ground around it is covered with woods, a portion of the Forêt de Montmorency, which is a series of copses rather than one continuous forest, and stretches away to the north-west of Domont. To the north and north-east is a wide valley, with long easy slopes on either side, well seen from the fort. The hills on the north and north-east, which would have to be occupied by a besieger, are very distant, and he could not commence his operations nearer than the brow of these hills, without being seen from the heights of Domont. If he attempted to push forward approaches and make a regular attack on the defences, he would have to advance down hill under the fire of the guns of the besieged. The position is, in fact, favourable to the besieged and difficult and inconvenient for the besieger.

The work at Domont will be supported on the left by a smaller fort, which is about to be commenced at Montlignon, on the top of a high hill, precipitous in rear but sloping gently to the front. This fort will have the Forêt de Montmorency in its front, and will command also the wide valley to the westward, traversed by the Chemin de-fer du Nord, and by the two high roads which pass respectively by Pontoise and Enghien, and join the great route of Calais at St. Denis.

From the Forêt de Montmorency westward to the Seine, is a level plain broken only by the sharp ridge, on which are the villages of Cormeil and Sannois. This ridge is of such a shape that, if it were in this country, it would probably be called the Hog's Back. It rises abruptly from the plain and forms the chord of the arc made by the bend of the Seine enclosing the peninsula of Houilles.

At Cormeil, at the extremity of the ridge, a large work is being built, which will secure for the garrison the undisturbed possession of the fertile peninsula of Houilles. It will command the Forêt de St. Germain and the Lower Seine on its left, and will fire over the wide valley on its right. Though the distance to the fort of Montlignon is $4\frac{1}{2}$ miles, it cannot be doubted that these two works together will prevent an enemy from penetrating to St. Denis by the valley between them. Fieldworks thrown up across the valley, with their flanks well secured and their front swept by the guns of the permanent works, would be unassailable, and an enemy attacking on this side would have to commence operations by a regular siege

of one or both of the works at Montlignon and Cormeil. It was proposed to construct also a work at Sannois, at the inner end of the Cormeil ridge, but this design has been abandoned.

Thus we may consider the line from the Seine at Cormeil to Domont to be secure, and we turn next to the right flank of the main position. The Fort of Domont itself will sweep the hillside to its immediate right, and prevent access by the Calais road. But further, to give general support to the two works in front, and more particularly to guard the right flank of Domont, a fort of the second class is to be constructed above Montmorency, on the southern spur of the Domont-Montlignon heights. This work will connect the advanced forts with the existing fortifications of St. Denis, and with the work at Stains, and will guard the ground about Montmorency, which is higher than that at Pierrefitte and Stains.

To the right of Domont, again, it has been proposed to occupy the hill of Ecouen, and the Committee considered a work there to be indispensable, because the summit of the hill there is nearly 100 feet higher than the fort at Stains. Having regard, however, to the facilities presented on this site for temporary works, it has been suggested that it may be left to be fortified at a time of expected attack, or a permanent battery may be thrown up there. Its distance from Domont is nearly three miles, and it is still further from Stains, the next work on its right. A work here appears to be more urgently required than at Montmorency, and I am disposed to think it would be preferable to construct at once a strong permanent fort of the second order at Ecouen, and postpone the construction of the one to be commenced at Montmorency.

Due south of Ecouen a fort of the second class is being constructed at Stains. This work will command the plain to the north-east, and guard the left flank of the inundations of the Molette and Morée, extending from Stains by Le Bourget to Bondy, which was of such value to the Germans during the last siege, but will now be included in the line of the defences. It will be remembered that the village of Le Bourget was occupied by the Germans in the last siege, taken from them by the French, and again captured by the Germans after a sanguinary and obstinate combat.

The inundation completes the line of the defences on the north. It is evident that the construction of these new works will enormously increase the difficulties of the besiegers, and will make the besieged powerful both for offence and defence in the quarter where they were formerly weakest. The general design is especially well suited for vigorous offensive action on the part of the besieged, an object which the projectors have kept steadily in view. An army may assemble in security in front of St. Denis, and, debouching with every advantage of ground in their favour on to the great plain to the north-east, may strike straight at the communications of an enemy coming from the eastward to attack Paris.

The Commission of Defence, as before stated, reported that the defences on the south of Paris, as well as those on the north, most urgently required strengthening, and works are being accordingly

constructed on the south. I propose, therefore, next to examine the general plan of the works now in progress on the south of Paris, before describing those that are projected elsewhere.

The defences on the south of Paris constructed in accordance with the project of 1840, consisted of a line of six detached forts from Fort Issy on the west, to Fort Charenton on the east. They are large and powerful works with plenty of accommodation for the garrisons, abundant interior space, and high escarps. But the position they occupy is bad. They are so close to the enceinte that they are only fitted to act as outworks, instead of playing the important part assigned in the present day to detached forts. Instead of commanding the ground in their front, they lie at the foot of a range of hills. On the wooded and irregular heights of Chatillon a besieger can build his batteries in security, at distances of 1,000 to 2,000 yards from the works. In the hollows and among the copses and farms of those heights the besieger was in the last siege more securely posted and better covered than the garrison in their permanent works.

It is indeed creditable to the powers of endurance of the garrisons, that these works held out against the Germans so long, for they cannot be considered capable of resisting a serious regular attack. The explanation is, that the Germans had not till nearly the end of the siege the means of making a regular attack. They hoped by blockading the place to reduce it to surrender for want of food for the inhabitants, without having to undertake the formidable task of a regular siege of permanent works armed with rifled ordnance. And when their siege artillery had arrived, the Prussians thought that they would obtain an easier and quicker victory by bombarding the place, and thus working on the fears of the famine-stricken inhabitants, than by commencing siege operations against the detached forts. The terror inspired by the Prussian batteries on these heights to the south of Paris, firing into the forts and bombarding all the quarters of the city on the left bank of the Seine, was very great, and will not soon be forgotten by the Parisians.

In selecting a position for the southern advanced defences, it was not at first sight obvious which was the best position to take up, and it was only after prolonged discussions had taken place, and much difference of opinion had been expressed, that the plan finally adopted was determined upon.

The idea first entertained, was to occupy the heights of Chatillon with a permanent fort, and to construct a line of works along the high ground to the right, extending by Chaville to Celle St. Cloud and Bougival. But such a line would have had grave defects, and would not have fulfilled the objects in view. Versailles would have been outside the defences, and the great advantages to be gained by the possession of that place, with all its public buildings, barracks, and stores, would have been lost to the besieged. Moreover, Versailles would have been under the fire both of the forts and of the siege batteries, and in the event of another siege would have been destroyed. It was therefore conceded, that it was not desirable to construct a line of works between Paris and Versailles.

To select a good position in front of Versailles was not difficult. From Versailles to St. Cyr, about three miles distant, no position fit for occupation is to be found. But on the other side of St. Cyr, in the fork between the railways to Granville and Brest, is a plateau admirably adapted for defence, and on the summit of this plateau the Fort of St. Cyr is being built. It is a very large work, and as it is between three and four miles distant from the fort of Haut-Buc on the left, and still farther from the nearest work on its right, it requires great power of independent resistance. In front of the work is a level plain without a hedge or an undulation, broken only by ditches and a few banks, and here and there by a farm house or a cluster of trees. Immediately before the left face of the fort there is a large lake, the Etang de St. Quentin. To the right the guns of the work will see across the plain towards Les Clayes, and in the direction of the far distant Fort of St. Jamme, but in order to obtain a fire over the valley of the Rû de Gally, that separates St. Cyr from St. Jamme, a smaller work will be constructed near the Bois du Chêne. On the left of the Fort of St. Cyr, the level ground extends for a great distance towards Guyancourt, in front of the forts of Haut-Buc and Villeras.

Thus, the Fort of St. Cyr is, in every respect, most favourably situated. It commands the main roads to Paris, and can hold out a hand to a relieving army coming from the south-west. It commands a wide and open plain, over which an army might debouch from Versailles to attack the lines of a blockading army, and its guns sweep this plain so thoroughly that an investing force would have to construct their lines at a great distance from the work.

It is a very interesting problem to consider at what distance, under such circumstances, besiegers must in future construct their investing lines. We are not, so far as I am aware, in possession of data that would enable us to solve the problem, but in future sieges the assailants will have to decide it. In designing permanent works, however, it can never be wrong to select a position which, being in other respects suitable, gives the widest possible range of fire for the rifled guns of a fort.

Eastward of Fort St. Cyr rises the Bièvre, a rivulet famous in the controversy that has taken place on the line to be selected for permanent occupation on the south of Paris. The stream runs for some miles a little south of east, nearly to Palaiseau, and then, turning to the north, passes between the forts of Bicêtre and Montrouge, and flows into the Seine near the Gare d'Orléans. The stream itself is insignificant, but the valley in which it flows is deep, and its sides are steep and broken with ravines. On either side of the valley are strong positions, easy to hold, and extremely difficult to attack.

The construction of a line of works on the left or northern bank of the Bièvre was strongly advocated. Such works, it was urged, would be far enough from Paris to secure the city from bombardment, and at the same time not too far advanced to receive assistance and reinforcements from the place. The forts would have in front of them a great natural ditch, which would be under the fire of their guns. There

would be sufficient space in rear of the forts for camping grounds for troops outside the city. The line of heights on the right bank was said to be lower than that on the left.

A further examination of the arguments in favour of this line has shown that they are not conclusive. The main defect of the line is, that however good the position on the left bank may be, the position of an assailant on the right bank would be equally good. The hills on the right bank are only a few feet lower than those on the left, so that they are not really commanded, and an enemy could occupy them, and readily render them very strong. If, therefore, the left bank were occupied by the forts a sortie in this quarter would be impracticable. And it is precisely in this direction that a relieving army may be expected to arrive, and that it is desirable for the besieged to be able to make an effort to break through the investing lines and meet them. Moreover, the valley of the Bièvre presents ground more suitable than can be found elsewhere, not only for camping and hutting troops far away from the city and its influences, but also for locating and pasturing flocks and herds for the sustenance of the garrison and inhabitants. Finally, as the projected outer circle railway will pass along the valley of the Bièvre, it is of the utmost importance to include that valley in the defences, and thus be able to use the railway for carrying stores and provisions to the forts. With a railway thus available in their immediate rear, no apprehension need be entertained of difficulty in supplying or reinforcing the forts. These arguments outweighed those that were urged in favour of the occupation of the left bank of the stream.

The position on the right bank is well adapted for the construction of a permanent line of defences. A level open plateau extends from the summit of the hills on the right bank of the Bièvre on the north, to the little stream of the Yvette on the south. At the cross roads at Saclay is a cluster of two or three houses, and scattered at long distances over the wide expanse there are here and there a few farms and solitary buildings. There are no hedges or fences within a distance of nearly 5,000 yards, and no cover for a besieger. The guns of the works will be able to range over the whole distance to the Yvette without any intervening obstacle. An investing force would have to take up in the first instance the line of the Yvette. If the forts had been placed in the north bank of the Bièvre, the investing force could have occupied the south bank. Thus, the placing the forts on the south of the stream, only about a mile in advance of the other line, throws back the investing lines three or four miles. The line St. Cyr-Palaiseau is not longer than the line St. Cyr-Chatillon, so that the length of the line of permanent works is not increased by their being advanced to the southern and more favourable position.

Three works are being constructed on this line—one at Haut-Buc, one at Villeras, and the third at the end of the plateau on the high hill overlooking the village of Palaiseau and the valley of the Yvette. The forts of Haut-Buc and Villeras are to be of the second class. Their earthworks are already rising up to such a height as to be visible far over the plain, which is so flat that the mere height of

the ramparts will give the artillery the power of sweeping the ground thoroughly for miles in advance, and will also give the artillery a command over the guns of the besieger. Under such circumstances preliminary siege operations must be difficult and tedious, requiring a large expenditure of material. And when the fire of the works has been subdued the besieger will have to commence a second and longer operation. Until the artillery of the forts is absolutely silenced, an advance over the open, save by regular siege works, will be impossible. Consequently every foot of progress over the plain would have to be won with the pick and shovel. Meanwhile the garrison could draw upon the reserves behind them to replace their artillery and stores. The troops in the forts, if exhausted, could be relieved by others who had been lying securely and quietly in rear during the opening attack. If provisions do not fail such a struggle may be prolonged indefinitely, and can end only with the exhaustion of one or the other combatant. And in this struggle the besieged will have one very great advantage. All their reserves of guns, ammunition, and of stores, will be close at hand in or round Paris, and the outer circle railway will bring them to the valley of the Bièvre, and set them down within a mile or two of the line of defence. The besiegers, on the other hand, would have to bring all their stores, guns, and ammunition, from a long distance. The railway would not bring them up within some miles of the batteries. During the last siege the railway terminus was four days by road from the siege park, and in a future siege the distance would be materially increased. In a regular siege of the new forts on the south the contest would become a trial of the resources at the disposal of the combatants, and the besieged would have great advantages, in the facilities they would possess for bringing those resources into action, as well as in the positions they would occupy.

The large work that is being constructed at Palaiseau will form the left of this southern, or, as the French usually call it, south-western chain of defences. The fort stands at the end of the plateau, which is here much narrowed, and in its front and to its left steep, almost precipitous slopes descend to the valley of the Yvette. The fort is high above the valley, and has a very wide command, but the slopes are so steep that its guns will not be able to see much of the ground in its immediate front. Two batteries will, therefore, be constructed in advance to see this ground. To the left of Palaiseau the steep slopes of the Yvette valley are continued in a northerly direction, but the stream itself turns again to the eastward, and continues its course across a flat and cultivated country to the Seine above Juvisy. About a mile and a half from Palaiseau there is a small round hill, called Les Buttes Chaumont. A permanent work will be built on this hill, and will strengthen the fort at Palaiseau, since its guns will sweep the valley and slopes of the Yvette to the left-front of that work. In rear of Palaiseau also a battery is intended to be placed at Verrières, to give support to the front line and connect it with the works in its rear.

The Palaiseau position is exceedingly strong. An enemy could no doubt establish batteries on the south of the Yvette, and bombard the

main and auxiliary works from a distance. But any advance across the valley would be attended by great difficulty. It would be almost impracticable either to scale the steep slopes in front of the works in the face of any opposition, or to advance by the regular operations of a siege.

The works we have enumerated from St. Cyr to Palaiseau protect Paris on the south and south-west. The forts are few in number and far apart, but they cover the ground sufficiently, and if they are well armed and garrisoned, and if the intervals be occupied by a moderate force, no enemy will be able to approach Paris in this quarter without first undertaking and carrying through under great disadvantages of ground a regular siege of uncertain duration.

In rear of this chain of defences the Commission have, in their Report, recommended the erection of a fort at Chatillon for the purpose of supporting the front line, and connecting it with the older system of works. It is probable that in making this recommendation the Commission were influenced by moral and political considerations. The inhabitants of Paris have not forgotten the impression produced on them by the Prussian occupation of this hill, which overlooks the city, and they cannot, of course, appreciate the value of the new and untried line of defences, out of sight of and eight miles distant from the place. To see Chatillon secured by a permanent work would inspire confidence among the inhabitants. It is, however, too far from the front line to give any effective support to it, and the line seems hardly to require such support. The work might be of some use in case of an enemy penetrating up the valley between Palaiseau and the Seine; but, except for this purpose, and apart from political and moral considerations, a fort here seems unnecessary.

Eastward of Palaiseau, the country is flat, as far as the Seine, seven miles distant. On the other side of the river, nearly nine miles from Palaiseau, a large fort of the first class has been projected. Across the flat ground it is intended to have no permanent fortifications further east than the Buttes Chaumont. It is argued that if a body of the enemy were to make their way up this valley, they would have in front of them the double line of the old defences. On their right and left would be the new works, which, though the distances are great, would probably be able to prevent the enemy from bringing forward any artillery, but light field guns. Without siege artillery he could attack neither the works in front nor those on his flanks. He could not maintain himself in such a position without great risk, as he would be exposed to counter-attacks from the troops on his right and left. No prudent general would put himself in such a position. If any assailant were so rash, the troops, on either flank, would quickly force him into disastrous retreat.

This reasoning is, no doubt, sound; and so long as an effective field-army of moderate strength was available, a force thrust into this opening could gain little advantage, and might, if repulsed, be annihilated. Such a force would be offering battle in front and on both flanks at the same time, and would be exposed to the risks of such an operation. And it is, no doubt, almost impossible to conceive that under any

circumstances Paris should be without some troops fit to take the field. In 1870, when one French Army was shut up in Metz, and another had been annihilated at Sedan, there was still, in Paris, a considerable number of troops, who could be regarded as available for active operation.

But defeat and retreat, in the face of the enemy, may disorganize drilled troops, so that for a time they may be unfit to act in the open field, and the troops taking refuge behind the fortifications of Paris would be chiefly beaten troops, or reserves and recruits of various degrees of steadiness, men on whom it would be unwise to rely for offensive movements at the commencement of the siege. At the beginning of the siege, moreover, the enemy's spirits would be raised by recent victory, and neither General nor soldiers would be in the temper to hesitate, if they saw an opportunity, of doing an injury to the besieged at the cost of some danger to themselves. Under such circumstances enterprises have been often carried through successfully and with little risk, which would never have been attempted, if both the forces engaged had been in an equally good condition of *morale* and discipline.

It appears possible, then, that at the commencement of a siege, a bold and enterprising enemy might try to make a raid through such a wide space as intervenes between Palaiseau and Villeneuve St. George. The work at the Buttes Chaumont will command a part of the flat ground, and the bend of the Seine to the westward of Juvisy will narrow the space available for his movements; but a column might advance up the valley without going within four miles of any permanent fort. They would be stopped by the old line of detached forts, and they would probably be unable to capture any permanent work. But they might damage the outer circle railway; they might destroy or carry off stores and provisions and cattle, collected for the besieged; they would spread terror among the inhabitants and the garrison at the very time when it would be most desirable to inspire confidence in all who were within the circle of defences. Considering the effect of such an incursion, it would in my judgment be worth while to construct a small fort between the Buttes Chaumont and the Seine. If this fort were constructed, the gap would be closed, and the work at Chatillon would no longer be required for the purpose of repelling an incursion through the opening.

The position of Villeneuve St. George is of the highest importance. The site selected for the fort is on the top of a steep hill, at the foot of which flows the Seine on the eastward, and the Yères on the south and south-east. It is thus the pivot of the south-eastern defences, whether the line of the Yères be adopted, or whether, as is contemplated, a line be taken up towards the Marne at Ormesson. The fort will command three lines of railway and the course of the Seine. It will see well over the valley in its front, and have a good command to the east and west. It will guard the passage of the Seine at this point, where the Prussians crossed when advancing in 1870, to invest Paris on the south. When the fort is built, an army coming from the east to attack the south will have to cross at Corbeil, ten miles, or Melun, twenty miles, higher up the river.

The ground required for the fort at Villeneuve St. George has been bought, but work has not been commenced. The funds immediately available for defences were limited, and it was thought better to devote the whole of them to strengthening those parts of the circle round Paris where the old defences are weakest. It was at first proposed to begin the work at Villeneuve St. George, omitting those at Haut-Buc and Villeras, but these two works were essential for the line from St. Cyr to Palaiseau, and the fort at Villeneuve without the works proposed to the north-east of it, would be isolated and unsupported. It was therefore decided to postpone the work at Villeneuve in favour of the south-western defences.

The eastern defences of Paris are already strong. The detached forts built according to the project of 1840, are farther from the enceinte than those on the south, and the ground does not offer such facilities to the besieger as that on the north and south. The windings of the Marne in the south-east forbid any direct attack, but they likewise prevent any attempt at a counter attack on the part of the garrison.

It is, therefore, considered necessary, eventually to occupy the left bank of the Marne, on the line from Villeneuve St. George to Ormesson and Noisy-le-Grand. Nothing has been decided, with respect to the work or works south of Ormesson. North of Ormesson a fort has been projected near Villiers and Noisy, which would cover the four bridges over the Seine at Brie, Nogent, Joinville, and Champigny, and give the besieged free access to the left bank of the stream, but nothing is yet being done towards the construction of this bridge head of the Marne.

North of the Marne, the existing defences of Paris on the east consist of a line of works on the edge of the plateau of Montreuil. The principal forts are Romainville, Noisy, Rosny, and Nogent. There are also some redoubts and entrenchments. The position is strong and good, and the works are sufficiently far from Paris to secure the city from bombardment. The necessity for additional defences here is not, therefore, so pressing as in the north and south. It is, however, desirable to deprive the enemy in a future siege, of the power of occupying the strong positions in the Forêt de Bondy, where the Prussians placed their batteries in 1870-71, and the occupation of which rendered sorties at this part of the line impracticable.

It has been determined, therefore, to occupy the summit of the ridge that runs east and west, parallel to the Canal de l'Ourcq, by a fort above Vaujours. This work will command the great north-eastern plain to its left in front of Bondy, which is at the end of the inundation previously mentioned, and will thus connect the northern with the eastern defences. Its guns will see along the ridge in front, and will command the flat ground south of that ridge for some miles. A range of hills runs at right angles to the Vaujours ridge by Montfermeil. A work of the second order is to be placed on a round hill at the south of this range, near Chelles. This fort will command the Marne on its right, and the level ground towards Lagny in its front. The position Chelles-Vaujours is exceedingly strong. The

ridge in front of the principal work is seamed with ravines and thickly wooded, but the ground in front of the rest of the position is open and level, and well seen from the sites selected for the works.

It remains only to describe the defences projected for the west of Paris. Westward from Marly runs a range of hills culminating at Ste. Jamme and Aigremont. The summit of the hills here is perfectly flat, and of that peculiarly open character common in France, but never seen in this country. The slopes, both on the north and on the south of the plateau, are so steep as to be almost inaccessible, except by the winding roads, which connect the villages. A fort of the second class at Aigremont will command the wide valley and the windings of the Seine on the right of the position, which are overlooked from the northward by the work being constructed at Cormeil. A fort of the first class at St. Jamme will command the valley of the Rû de Gally and form a connection, though at a great distance, with the St. Cyr defences. Though the distance from St. Jamme to the Bois du Chêne is about five miles, the valley between them is little more than half that distance across, and is so thoroughly commanded by the heights behind St. Jamme, that no force could descend it without first obtaining possession of those heights.

It has been suggested that the heights of Hautie on the right bank of the Seine should be occupied, but the work projected there is not included in the project finally approved.

It was at first proposed, instead of occupying the St. Jamme plateau, to place a work at the Trou d'Enfer near Marly. But the Forêt de Marly would then have been abandoned to the enemy, and would have been a position of great strength for a blockading force. The idea of occupying the Trou d'Enfer does not, however, appear as yet to have been altogether abandoned, as it is thought an intermediate work on this site may be advantageous to connect the very advanced works at St. Jamme with the fortress of Mont Valérien.

Considering that the position of Marly could be easily strengthened with field works, and that Mont Valérien already renders Paris secure both from attack and bombardment on the west, it has been determined to postpone the construction of these defences on the west, until more pressing needs elsewhere are supplied.

The general design for the new defences round Paris is undoubtedly bold and masterly. The projectors have discarded the theory that detached forts must be within sight and easy range of the enceinte, a theory abandoned long since in this country, but which continental engineers have been unwilling to relinquish. The long range of rifled artillery admits of great latitude in the choice of positions, and the French engineers have availed themselves of this advantage, and of the facilities afforded by the ground, to cover a great extent of country with well-placed works very few in number, having regard to the length of the line occupied. These works, however, form merely the skeleton of the system of defences necessary to defend Paris. Redoubts, batteries, and entrenchments must be thrown up at a time of expected attack in the intervals between the works. The presence

of the permanent works will make it easy to add these auxiliary defences. If, however, the permanent works were not to be built, the attempt to construct field works on the advanced positions at a time of expected attack would either never be made, or would probably be soon abandoned. Field works were very necessary, and were attempted to be thrown up by the French on the south of Paris before the last siege. But when the Germans arrived the works were still unfinished, and were at once given up.

The design of the forts under construction is radically different from that of the old works of the scheme of 1840. The bastioned trace is no longer seen in the faces of the works, and the ditches will be flanked by caponiers. The earthworks for the ramparts are being thrown up without waiting for the completion of the casemates, and are expected, according to the report of the Commission, to be so far advanced by the end of the first year as to form "good redoubts." In other words, the works on the north and south are intended to be made during the present year capable of offering resistance. The casemates, magazines, and caponiers, commenced at the same time as the earthwork, are to be finished next year. The escarps and counterscarps, the formation of the ramparts, and the other preparations necessary for the reception of the permanent armament, are to be completed in the third year after commencement.

It is thought that a fort should be manned and organised like a ship, and all the crew off duty should be below, and bomb-proof accommodation is therefore being provided for nearly the whole of the garrison. The garrisons are estimated at from 1,200 to 1,500 men for each fort. The number required for the garrisons of the whole of the advanced forts, calculated on this basis, would be less than 30,000 men. These must all, however, be good troops, for a panic in the garrison of one of the advanced works at a critical moment might have very serious results.

It is considered, that under any conceivable circumstances, there would be in Paris, in addition to these garrisons, 50,000 regular troops, who would be available for guarding the intervals between the forts, and manœuvring at the points most threatened by the enemy. The enceinte and the whole line of detached forts would be entrusted to the reserve of the territorial Army, men between 34 and 40 years of age. The territorial Army could also furnish 100,000 men fit to be associated with the regulars in guarding the outside of the circle and in active operations. Such a force would suffice to defend the place, and to make the sorties which are necessary for a good defence.

The cost of the whole project is estimated at 60 million francs or £2,400,000, of which £2,048,000 are required for works, and the rest for land and contingencies. For the tête-de-pont of the Marne, a round sum of £440,000 is put down. From the amounts allotted to the other works, some idea may be formed of their comparative size and importance. The smallest forts are to cost £60,000 each. The works of the second class, such as Haut-Buc, Villeras, Montlignon, and others, are each to cost £80,000.

Domont, St. Jamme, and Villeneuve St. George, are estimated to cost £120,000. The estimates for the great fortresses of Palaiseau and St. Cyr with their outworks rise to the large totals of £160,000 and £168,000 respectively. The project, as a whole, has been approved by the National Assembly, and a sum of £280,000 was appropriated in 1874 to commence the more important works, and acquire the sites for the whole of the proposed defences on the north and on the south.

I will briefly recapitulate the principal points that are to be occupied by works. On the north, a large work at Montlignon, and a small one at Domont, will occupy the centre of the position. A work on the ridge at Corneil guards the left of the line, and overlooks the valley of the Lower Seine. Ecouen, Montmorency, and Stains guard the right, and command the plain of the north-east, and the inundation extending to the Canal de l'Ourcq near Bondy. Corneil, Domont, and Stains are in progress, and the other works will be begun shortly.

On the south-west and south, the ground between the Rû de Gally and the Seine will be occupied by five works. The large fort of St. Cyr is in front of Versailles, and forms the right of the line, with a battery to fire across the Rû de Gally. Left of St. Cyr, the plateau of Saclay south of the Bièvre is occupied by two works of the second class at Haut-Buc and Villeras. The line is terminated by a large work at Palaiseau at the eastern end of the plateau, where the ground falls abruptly to the Yvette. In front of Palaiseau, two batteries will command the ground hidden from the fort by the steepness of the slopes. A work of the second class on the Buttes Chaumont will flank the end of the line, and command a portion of the space between Palaiseau and the Seine. All these works, except at the Buttes Chaumont, are in progress, and the earthwork of the ramparts well advanced towards completion. Behind Palaiseau, a battery will probably be placed at Verrières. A work has been projected at Chatillon.

The eastern defences are in two sections. The southern section will comprise the important work of Villeneuve St. George guarding the passage of the Seine, and the tête-de-pont of the Marne. The land has been bought for Villeneuve St. George, but the details of the tête-de-pont are not yet finally determined upon.

North of the Marne a fort of the second class is to be made at Chelles, to command the level ground in front and the course of the Marne, and a large work is to be built on the summit of the ridge near Vaujours, whence there is a good view over the plain of the north-east. On the west, two works, a large one at St. Jamme and a small one at Aigremont, will occupy the hills, flat on the top but almost precipitous at the sides, which divide the valley of the Lower Seine from the valley of the Rû de Gally. A work near Marly has been proposed and discussed. The defences of the east and west are not yet commenced.

The defences of the North and South will, however, suffice to give most of the advantages desired. Paris will be secure from bombard.

ment when they are completed, and in two directions the ground will be favourable for making sorties.

When the whole of the defences are completed, the perimeter of the area enclosed, measured from the salients of the works, will be about 77 miles, or more than twice the perimeter of the ground enclosed by the detached forts of the project of 1840. The length of the line of investment of a besieger of these works would be between 90 and 100 miles.

But the extension of the length of the line is only one of the advantages gained by these defences. The garrison will on every side hold possession of the salient and most commanding positions; enclosing a fertile belt of country, where provisions both live and dead may be accumulated, where troops can be camped and drilled and moved out of sight of the besieger, and away from the distractions of the capital. The inhabitants and the troops off duty may rest in perfect security, while the outer line is being cannonaded, instead of living night and day in a state of unceasing dread, as they did during the former siege. It will, under these circumstances, be far easier both to keep the inhabitants quiet, and to organize and drill the troops.

Paris will be stronger than it ever was before, more difficult to invest, more capable of making a prolonged resistance. Larger forces will be required, and greater risks will be encountered by the blockading force. The ground they will have to occupy will be more difficult to hold, the distances to be traversed in collecting troops on a threatened point will be longer. The besieged will be able to make more effective attempts to break through the line than heretofore, and will probably be better provisioned. Under these circumstances could an effective blockade be maintained long enough to reduce the garrison to surrender for want of food?

If the blockade could be maintained, the place might hold out for a very long time, but must succumb at last. To maintain an effective blockade, however, would require much larger forces than the Germans had in 1870. If a blockade could not be maintained the invader might either undertake a partial siege, attacking one side and leaving the other side open; or he might abandon the siege, overrun and devastate France, and endeavour to reduce the country to such a state of exhaustion as to compel the nation to submit.

In either case the invader would have before him a most difficult task. The siege of Sebastopol showed how tedious is the siege of a great fortress well supplied, and with the power of replenishing its stores and food, and reinforcing its garrison. The siege of Paris in 1870-71 showed how great is the power of resistance, and what are the resources contained within the place itself. If those resources were supplemented by fresh supplies from outside, if non-combatants could be sent out of the place into parts of the country unoccupied by the enemy, if, moreover, the army in Paris had, as they will have when the new works are finished, fair and open ground in several parts of the circle of defences for making vigorous counter-attacks, the siege could

only be brought to an end by the complete exhaustion of one of the combatants.

And the invader, far from his base of supplies, would have at the same time to push forward the immense siege works necessary for the capture of the place, to bring up from a distance supplies of siege artillery, ammunition, and stores. He would have to maintain and feed the force necessary for the attack of the place, and also the force required for preventing the formation of, or opposing when formed, the armies that would be raised in other parts of France. All this he would have to do for many months, perhaps, nay probably, for years, for Paris, strengthened by the new works and abundantly provisioned, would hardly be captured in a period to be measured by months. Before such an undertaking as this the most wealthy and powerful invader must pause.

Or, on the other hand, the invader might decide to leave only an army of observation before Paris, and to employ the bulk of his forces in endeavouring to subdue the rest of the country, and to appropriate to himself or exhaust the supplies it contained. But how great and prolonged an effort and how vast would be the forces required to subdue and hold the whole extent of the country from Belgium to the Pyrenees, from the Rhine to the Atlantic, in the face even of such a resistance as was made in 1871! And when this task was accomplished, if it ever could be accomplished, would Paris capitulate? Is it likely that, with Paris and all its resources still untouched, the nation would not have both the spirit and the power to hold out? If they did hold out, the invader would have to commence the siege of the place. The besieged would be able to draw fewer supplies than before from the exhausted country; but meanwhile they would have laid in such stocks of provisions, and have so drilled and trained the garrison, that the siege would be more difficult than ever.

If, then, the investment of Paris be rendered impracticable, the operations necessary for reducing the nation to such a prostrate condition as to sue for peace would be of such a character, that the invader must, after success in the field, be compelled to pause and reconsider his position. Before him would appear a vista of interminable warfare, and the victory looming dimly in the distance would only be obtainable at the price of the exhaustion of his own nation by years of unceasing efforts.

In such a posture of affairs it might happen that, as Torres Vedras stopped Massena in 1810,—as the Quadrilateral stopped Louis Napoleon in 1859,—the Fortifications of Paris might save France.

PRIZE ESSAY, 1875.

UNIVERSAL CONSCRIPTION: THE ONLY ANSWER TO
THE RECRUITING QUESTION.

"On trouve encore des officiers vraiment volontaires, mais plus ou trop peu de soldats."—COMTE, "PHILOSOPHIE POSITIVE," vi. 354.

By Captain H. W. L. HIME, R.A., F.S.S.

(R.A. Institution Gold Medallist.)

Introduction.

THE following Essay is divided into three Parts.

The first Part is an historical sketch of the English System of Voluntary Enlistment, from which I draw this conclusion; that the system never was a success, that it is breaking down at the present time, and that it will, in all human probability, collapse altogether before very long.

The second Part is an inquiry into the respective merits of the four possible systems of Recruiting, from which I draw this conclusion; that the Compulsory is the only system that will satisfy the exigencies of our case, as far as the Home Army is concerned.

In the third Part I propose, for the Home Army, a scheme of Universal Conscription, without substitution or dotation.

PART I.—ON VOLUNTARY RECRUITING.

Instead of building vain theories upon empty arguments, let us trace the working of the voluntary system of recruiting in England by means of facts and figures.

I. From 1715 to 1867 it was found necessary, from time to time, to offer a bounty, in order to induce men to enroll themselves in our voluntary Army. In 1745, the bounty for the Guards was £6. In 1759, the bounty offered by Government having proved insufficient, "several large towns opened subscriptions to be appropriated as bounty money to volunteers enlisting in the Army. The London subscription amounted to £7,039, procuring 1,235 men at £5 5s. each." This was no isolated occurrence; for in 1716, "large contributions had been made by different counties and towns, for the purpose of assisting Government in the raising of recruits."

These curious facts prove the truth and justness of Professor Cairnes' remarks upon a speech delivered by the Earl of Derby at Liverpool, 1871. Alluding to Conscription, Lord Derby said that public feeling revolts against the practice, "in a country where the sentiment of individual freedom and conscience is as highly developed as here."

"The times are serious," replies the Professor; "let us purge our souls of cant. What does this system of 'voluntary' recruiting, which we are asked to believe is the only system suited to our highly-developed political and moral feelings, mean? Simply this, that people who have sufficient means, instead of being required to pay their just debt to their country in their own persons, are allowed to hire others, who have little choice but to accept this offer, to expose their persons in their behalf. No less lofty principle than this, it seems, can satisfy the highly-developed consciences

¹ Clode's "Military Forces of the Crown," ii. 5.

² Dr. Marshall's "Military Miscellany," 1846, p. 48.

of the English people. The moral fastidiousness displayed is only surpassed in China, where, it is said, men may procure substitutes for the gallows. The principle would, indeed, need to be high; for it is certainly not redeemed by the practice—by what is known as 'our pot-house system of recruiting,' in which men are entrapped, to borrow the words of the late Sidney Herbert, 'by every kind of cajolery and inducement we can devise, and in our necessity we descend to those means which men do not have recourse to till they think all others are exhausted.' Well, all this may be highly convenient; but, in the name of common decency, let us cease to put it forward as a national distinction to be proud of—a practice entitling the people who employ it to look down, as from a lofty height, on the nations who expect each capable citizen to bear his share in his own and his country's defence."¹

In 1775, the bounty was £3, and militia volunteers for the Line received £6 in 1802.² The bounty for the ordinary recruit in 1803 was £16.³ In 1855, the bounty was £8 for the Infantry, £9 for the Marines,⁴ and £10 for the Artillery.

Bounties continued to be given, at varying rates, until 1867, when they were abolished: but I have no hesitation in saying that, with our present system of recruiting, it would be necessary to revive them, if we became involved in a great war.

II. "In 1614," says Adam Smith, "the pay of a foot soldier was the same as in the present times (1776), eightpence a day. When it was first established it would naturally be regulated by the usual wages of common labourers, the rank of people from which foot soldiers are commonly drawn."⁵ The experience of the century which has elapsed since Smith wrote amply proves the truth of the principle implied in the foregoing sentence. The wages of labour and the pay of our volunteer soldiers have been surely, although slowly, increasing during the last hundred years. In 1797, the pay of an Infantry soldier on home service was one shilling a day, with stoppages of 6*d.* a day for rations.⁶ In 1874, his pay is one shilling a day, with free rations of bread and meat. This may seem a trifling increase, considering the time that has elapsed; but we must not confound a soldier's *pay* with his *income*. His pay has somewhat increased, his income has enormously increased since 1797; because it has always been the policy of Government to improve his condition, "rather by waiving deductions and adding other consequent advantages, as better clothing, barrack, and hospital accommodation," than by increasing his actual pay.

III. An additional inducement was held out to recruits, not many years ago, in the shape of good conduct pay. I may remark that the good conduct required is of a singularly negative character. To become entitled to good conduct pay, a soldier has neither to distinguish himself as a soldier, nor as a man. It is unnecessary for him to become noted for expertness at drill, or for the general smartness and cleanliness of his personal appearance. He has to raise himself to no standard, however low, of physical, moral, or intellectual worth. All he has to do to gain his badge is to abstain, for a certain period, from positive military evil, or to sin so discreetly as to avoid detection.

In 1870, the good conduct pay of the Army amounted to £218,463,

¹ "A National or a Standing Army?" in "Political Essays," by J. E. Cairnes, Emeritus Professor of Political Economy, University College, London, p. 232-3.

² Clode, i. 287.

³ *Ibid.*, ii. 53.

⁴ *Ibid.*, i. 308, note.

⁵ "Wealth of Nations," i. 81; Rogers' ed.

⁶ Clode, i. 106.

and in 1873 to £246,852. The increase in the amount is easily accounted for. In June, 1870, appeared a new Warrant, the regulations of which rendered it easier to gain a badge than before. The natural result was, that a greater number of men gained badges.

In addition to good conduct pay, a certain number of good conduct medals, with or without gratuities, are annually distributed among those who have been in receipt of good conduct pay for a certain time. Taking the medals to be worth 5s. each, and the gratuities to average £7 each, the value of these prizes amounted in 1873 to £9,698, exclusive of eight medals with annuities.¹ Whether these sums were paid out of the ample funds supplied by the fines for drunkenness, I know not.

IV. In 1697, there was only barrack accommodation in England for 5,000 men, and an estimate was laid before Parliament in that year for tents, &c., for 6,000 Infantry and 4,000 Cavalry. The misery endured by the unfortunate troops who were thus exposed, all the long year, to the vicissitudes of an English climate was great; but it was not great enough to overcome the popular prejudice against barracks, and this state of things continued, more or less, to exist until 1792, when the barrack department was formed and barracks were commenced on a large scale. In 1707, two regiments who had been long encamped in the Isle of Wight suffered so severely during the month of October that orders were given to hire "either barns or empty houses, whereby the soldiers may be kept from perishing through the severity of the weather." Where barracks did exist, they were of the worst construction. During the year 1704, Lord Paston's regiment, which was quartered at Portsmouth, was reduced by death and desertion to one half of its numbers, "from the sickness of the place, the want of firing, and the badness of the barracks." In 1718, £9,300 was voted to build barracks in various towns in Scotland for the accommodation of 800 men in all, the rooms of which, 18 feet by 17 feet square, were to contain five men each.

"By way of contrast to the expenditure of 1718," says Mr. Clode, "take that of 1859-60 on the new palatial residence of the Guards at Chelsea, built at a cost (including ground, but excluding furniture) of £296,831: the first sum is under £12 a man, and the second not under £225 a man."²

V. About a century ago,

"an unhappy governor wrote that he had under his command a company of troops which for fifteen years had received no fresh bedding: and 'many of the soldiers were very ill, and in y^e winter ready to starve.' A special messenger was sent home to lay the matter before the Board of Ordnance; but the Board adroitly pigeon-holed his petition for four years, and in the language of a subsequent letter, 'for want of bedding, many of y^e soldiers have since perished.'"³

The bedding and clothing of the troops is now incomparably better than that of the classes from which they come; and large sums are annually spent on these items, to induce men to remain in the ranks. In 1872-73, the estimate for clothing was £751,700, and £743,100 in 1873-74.

¹ "General Annual Returns of the British Army for 1872." War Office, 1874. Tables 35, 36, and 37.

² The above facts are taken from Mr. Clode's "Military Forces of the Crown," chap. xi.

³ Duncan's "History of the Royal Artillery," i. 21.

VI. The like remarks apply to the food of the soldier. Improvements might be made in his breakfast and tea, but his dinner is very much better than that of the lower classes. In 1872-73, £1,784,300 was voted for provisions, &c., and £1,980,700 in 1873-74.

VII. Vast sums have been spent in providing the troops with suitable hospital accommodation and medical attendance, and it cannot be doubted but that they are in this respect infinitely better off as soldiers than they would be as civilians. £334,172 was spent on the hospital at Netley, and £228,355 on the Herbert Hospital at Woolwich, the one being at £294, and the other at £344 per man.¹ The pay of the Medical Establishment is nearly a quarter of a million per annum.

VIII. As early as 1697,² the prospect of a pension had necessarily to be held out to men enlisting for life or long service. The annual expenditure on pensions increased gradually from £181,402 in 1806 to £1,291,200 in 1872. (See Table A in the Appendix.³)

Having described the inducements held out from time to time to men to enrol themselves in our voluntary Army, I shall now endeavour to show the effect produced by these inducements in getting recruits for life service, long service, and short service.

IX. From a very early period the ordinary system of raising recruits in England was called the contract system. A certain sum of money, according to this system, was annually allowed to the Colonel of a regiment on condition that he kept the regiment up to a certain strength, and he was allowed to enlist men on what terms he could. It is needless to say that "so long as this mode of providing recruits was in force, the officers had a pecuniary interest in continuing the system "of life enlistments."⁴ This system succeeded in supplying England with the handful of men she required for her standing army in time of peace; but it was inapplicable in time of war, for two important reasons. In the first place, "it was the national policy that the army should be disbanded after each war, and therefore, had Parliament adopted long enlistments, an excuse would have been given to the Crown for keeping the army on foot while those enlistments were in force."⁵ In the second place, "the absence of any barrack accommodation, sufficient for a large army, rendered it a matter of necessity to disband the troops on the war establishment upon their return into the kingdom."⁶ Now the want of barrack accommodation was due, as Mr. Clode admits,⁷ to the well-grounded apprehension that an increase of the number of barracks would infallibly lead to an increase of the strength of the standing army. The adoption of short service enlistment, therefore, on the breaking out of war, in order to raise the peace establishment to a war establishment, was due in no way to any acknowledged superiority of short service over long or life service, but entirely to political causes. Prior to the present century, then, although ordinary enlistments still continued to be made for life, short service always prevailed in the army whenever Parliament raised it from a peace to a

¹ Clode, ii. 464.

² Clode, ii. 275.

³ Ibid., ii. 281, 781; and "Statesman's Year Book," 1874.

⁴ Clode, ii. 24.

⁵ Clode, ii. 25.

⁶ Ibid.

⁷ Ibid., i. 257.

war establishment and provided the recruits by coercive measures or by a special vote of levy money.¹

In 1775 the American War of Independence broke out, and on the 8th November of that year the Minister at War stated, in the House of Commons—

"that all his exertions had failed in recruiting the Army to its requisite strength. He said no means had been untried to complete the corps to the full complement—the bounty had been raised, the standard lowered, and attempts had been made to enlist even *Roman Catholics*, and to incorporate foreigners singly into the British regiments, but all had failed in the expected effect."²

In 1796 Mr. Pitt carried a Bill for five years' service in Europe only. The restriction of the area of service was, no doubt, intended to be a safeguard against the difficulties which led to the repeal of Queen Anne's three years' Act, and to the Mutiny of the 68th and 77th Regiments at Portsmouth in 1783. "It was soon found to be impossible," says Mr. Clode, "to carry out the regular routine service" of the Army with the three years' service men enlisted under 7 Anne, c. 2; "for they demanded their discharge rather than go into bad quarters or unhealthy climates. The clause, therefore, was omitted from the Mutiny Act after 13 Anne, c. 44, and the regiments on the Peace Establishment were recruited upon the ordinary conditions of life enlistment."³ In ignorance, or in defiance of these facts, however, the 68th and 77th Regiments were largely recruited, some eighty years after, with men engaged to serve for three years, or until the end of the American war. In 1783 both these regiments refused to embark for India, "alleging as a reason for their insubordination, that they were enlisted on the express condition to serve three years only, or during the American war."⁴ Mr. Pitt's Bill avoided to a great extent these difficulties, but it was open to the other objections which have always proved, and must always prove fatal to Short Enlistment Acts for Armies on the Voluntary System. Under the operation of this Act matters grew worse and worse until the year 1806, when a recruiting crisis, resembling that of 1775, occurred. "Throughout the whole war great difficulty had been experienced in providing a proper supply of soldiers;"⁵ "the hulks were drained, and the prisons emptied more than once to supply the want of recruits;"⁶ the Bounty rose in 1804 to £16 16s.: but all these measures failed; the effectives were 25,000 men below the establishment in 1806;⁷ and in that year Parliament was again called upon to decide "how we are to ensure to this country, what unquestionably it has never had, a never-failing and adequate supply of regular soldiers."⁸

As a solution of the difficulty, Parliament accepted Mr. Wyndham's Bill for limited enlistment, which divided the total service into three periods, as shown in Table B in the Appendix.

A man could claim his discharge at the end of the first period without

¹ Clode, ii. 25.

² "Military Miscellany," p. 48.

³ Clode, ii. 25.

⁴ "Military Miscellany," p. 58.

⁵ Alison's "History of Europe," vi. 105.

⁶ Dupin's "Military Force of Great Britain."

⁷ Alison's "History of Europe," vi. 112, note.

⁸ Wyndham's Speech in the House of Commons, 1806, in Alison vol. 107, note.

pension. He might claim his discharge at the end of the second period with a pension of five pence a-day for life. At the end of the third period he was discharged with a pension of one shilling a-day for life. If he claimed his discharge before the expiration of the third period, he was liable to be called upon to serve in an emergency; but after the third period he was free. This Bill continued in force only two years, in consequence of Lord Castlereagh carrying a clause, in 1808, to permit men to enlist for life, "by which means Mr. Wyndham's scheme of recruiting was practically annulled."¹

The reasons for this change are palpable. In the first place, as Mr. Clode observes,

"the whole tendency of the measure was towards *long* service, but obtained at a higher rate of pay and pension than had before been granted by Parliament for the same service. * * * The total cost, in a year or two after it came into full operation, has been variously estimated as ranging between £1,300,000 and £1,500,000. per annum."²

In the second place, a small increase in the Bounty secured men for life service, at far less cost.

"Before Wyndham's Bill was introduced, Lord Castlereagh assured the House of Commons that the difference between twelve guineas for unlimited, and ten guineas for limited, service, had induced all but 250 out of 9,000 men to enlist for the former service; and at a later date it is undoubtedly true that the difference of only 16s. given in 1819, induced recruits to select unlimited service."³

Recruits had the option of enlisting for limited or unlimited service from 1808 until 1829, when limited engagements were wholly discontinued.⁴ A glance at Table C in the Appendix⁵ will show the superiority of life over limited service, in the popular estimation.

In 1847, with excellent reason, unlimited service was abolished, and the period of service for the Infantry was fixed at ten years, with permission to re-engage for eleven years. During the Crimean war, this Bill had to be relaxed, and the Crown was authorised to enlist men for short service. Had the extra men required during the war been enlisted for long service, they would have proved an unnecessary burden to the country on peace being made. Short service, even with high bounties, was cheaper, and short service, consequently, was adopted.

In 1867, the period of service was fixed at twelve years, with power to re-engage on completion of two-thirds of the original engagement. "The number of re-engaged men on the 30th June, 1867, was 31,205, "and from that date to the 31st December, 1868, a further number of 40,988 men re-engaged under the Act of 1867—making a total of 72,193 long service men working for future pension."⁶

Finally, in 1870, was passed an Act, which "aimed at 1st, improving the social position of the soldier; 2ndly, mobilising the Active and Reserve forces; 3rdly, popularising the Army; and 4thly, "forming an efficient Reserve."⁷ These were splendid aims indeed; and what were the means adopted to gain them? A Short Service Act,

¹ "Military Miscellany," p. 71.

² Clode, ii. 286, 288.

³ Clode, ii. 28.

⁴ Ibid., ii. 30.

⁵ "Military Miscellany," pp. 74, 75.

⁶ Clode, ii. 31-2.

⁷ Dr. Leith Adams, F.R.S., *vide* his lecture in the R. U. S. I. *Journal*, vol. xviii. No. 7, p. 67.

without bounty! Mrs. Partington's exploit was nothing to this. That excellent woman, as Sidney Smith tells us, lived by the sea. One morning an unusually high tide invaded her cottage, and when the neighbours came to her assistance, they found her sweeping out the sea with a besom. Her well-intended efforts, however, were futile. She was equal to a bowl or a puddle, but she was no match for the Atlantic Ocean! Acts of Parliament and War Office circulars have a certain power, but they cannot stem the tide of popular opinion. The Act of 1870 has not improved the social position of the soldier; it cannot be said to have popularised the Army; and it certainly has not formed an efficient Reserve. Although assisted by the operation of certain causes, never dreamt of by its framers, the Act of 1870, far from being able to stand the strain of war, is confessedly incapable of satisfying, single-handed, the demands of our Peace Establishment. Long service has not yet been abolished; the Short Service Act itself had to be considerably modified very shortly after it came into operation; and a man can now (I believe) enlist for three, six, twelve, or twenty-one years. In plain language, short service and long service recruiting are going on side by side. The expedient is not a new one.

The foregoing sketch of the length of service at different periods shows that short service, long service, and life service have been repeatedly tried by bewildered Ministers, from the Revolution down to the present time, not only simply and singly, but in every possible form and combination that human ingenuity could suggest, and that every successive effort to stimulate voluntary enlistment has, sooner or later, ended in failure. Let us enquire into the causes which led to such results.

X. The general disinclination of the industrial population of this country to military service is sufficiently proved by the magnitude of the inducements found necessary to prevail upon men to enlist, and the large amount of desertion that has always existed in our Army. This disinclination being granted, it is evident that had the inducements offered to men to enlist for short, long, and life service been equal, the recruits, one and all, would have selected short service. History proves, however, that while there has never been a sufficient and continuous supply of recruits for short service, there has rarely been a scarcity of recruits for long and life service. This result must consequently have been due to some difference in the inducements in either case. Did any such difference ever exist? Always. While the prospect of a pension has always been necessarily held out to men enlisting for long and life service, it has been always as necessarily withheld from recruits for short service. To this cause, and to this cause alone, has been due the eventual collapse of every Short Service Act, from the want of recruits.

"But," replies Mr. Holmes, M.P., "there is an abundance of incontestible proofs * * * that a pension after a long period of military life has ceased to prove a sufficient inducement. Among them is a statement just made by the Inspector-General of Military Prisons. According to his report for the year 1873, the increase of desertions among old soldiers—that is to say, among men who have served fifteen years and upwards—is very marked; the proportion being 4 per cent. for that year, compared with 2·2 for the year before."¹

¹ *The Times*, 4th November, 187

What Mr. Holms' other incontestible proofs are, I do not know; but this proof is far from being incontestible. In 1872, 5,861 men deserted from the Army; 5,702 deserted in 1873. Of these, 2,034 were imprisoned in the military prisons in 1872, and 1,793 in 1873. The deserters of fifteen years' service and upwards, imprisoned in military prisons, numbered 36 out of 2,034, or 1·7 per cent. in 1872, and 32 out of 1793, or 1·7 per cent. in 1873.

Mr. Holms' figures are not those of the Inspector-General of Military Prisons: they are those of the Revd. Mr. de Renzi, Chaplain of Millbank.¹ They relate only to the prisoners in one prison for two years, and their value was always so doubtful, that even Mr. de Renzi himself admitted they might be "purely accidental."² The first principle of statistical investigation is, that we should deal with large figures extending over a considerable time; and when this principle is wantonly violated, as it has been in this case, figures may, indeed, be made to prove anything.

The supply of recruits has almost always been deficient for short service; it has been generally sufficient for long and life service; and, I repeat, the only assignable reason for the difference in either case, is the difference in the inducements, or, in other words, the pension.

In the early stages of society every man is a warrior, and wars are waged, on no principles of right or justice, but simply from a combined love of bloodshed and plunder. As civilisation progresses, however, the military spirit gradually gives way to the industrial; the military class is absorbed more and more by the commercial; and arms become, at length, a distinct and separate profession. When this stage of civilisation is reached, men adopt the profession of arms on the same prudential grounds that they adopt any other profession or calling.

*"Ille gravem duro terram qui vertit aratro,
Perfidus hic caupo, miles nautæque, per omne
Audaces mare qui currunt, hæc mente laborem
Sese ferre, senes ut in otia tuta recedant,
Aiunt, quum sibi sint congesta cibaria. . . ."*³

The hard-handed ploughman sweats behind his plough, the thievish publican toils in his bar, the soldier and the sailor brave the dangers of the land and the sea—and why? To accumulate the little treasure that will enable them to pass the evening of their lives in peace and repose.

Long service enlistments necessarily involve a pension that places its recipient beyond the dread of starvation. Short service as necessarily excludes all hope of pension. It fritters away some of the best years of human existence, and then throws a man back upon the world to recommence his life. No one has described more admirably than Goldsmith this inevitable tendency of every Short Service Act.

"Not far from this city," he says, "lives a poor tinker, who has educated seven sons, all at this very time in arms, and fighting for their country; and what reward, do you think, has the tinker from the State for such important services? None in the world; his sons, when the war is over, may probably be whipt from parish to

¹ "Report of the Inspector-General of Military Prisons," 1873, p. 21.

² Ibid.

³ Horace, Sat. I. 1, 25.

parish as vagabonds, and the old man, when past labour, may die a prisoner in some House of Correction."¹

It is easy to understand, then, the unwillingness of men to enlist under a Short Service Act; it is easy to understand their unwillingness to remain under the flag when they have enlisted; and desertion, be it remembered, is a far more formidable evil in a short service than in a long service army, because, as the Royal Commissioners of 1859 pointed out, desertion is "mainly confined . . . to the earliest periods of the soldiers' service."² Table D in the Appendix proves the correctness of this statement.³ From that table it appears that of the 33,419 men who deserted during the first twenty years of their service from 1859 to 1865, 27,306, or '817 of the total number, deserted at five years' service and under,—a fact which enables us to compare the relative amount of desertion in long and short service armies. Let us suppose that two armies of equal strength are raised, the one for long service of twenty years, the other for short service of five years; and that the percentage of desertion, during each year of service, corresponds in both with the average of the seven years, 1859—65. Then, if the total amount of desertion in the long service army for twenty years be x , the total amount of desertion in the short service army, or series of four armies, will evidently be four times '817, or $3\cdot268x$. Thus, if the long service army loses 10,000 men by desertion in twenty years, the short service army would lose 32,680 men. This calculation only applies to the men originally enlisted in either army; but the recruits enlisted to fill the vacancies would desert in a similar proportion.

On the whole, then, we may safely conclude that nothing short of a radical change in the constitution of human nature will ensure a sufficient and continuous supply of recruits from a Short Service Act in a civilised community, with a voluntary system of enlistment.

The foregoing remarks on short service apply only partially to the Act of 1870; for unlike all previous short service Acts, it is a Short Service Act with a temporary pension.

For a short time service in the Reserve was naturally taken by the classes among whom we enlist to mean something, and 4*d.* a day was not considered sufficient compensation for the sacrifices such service might entail. Ere long, however, it was discovered that service in the Reserve meant simply nothing, and that the only obligation imposed upon the reserve soldier was to draw his pay. Practically, therefore, the Act became a Short Service Act with a pension of 4*d.* a day for a certain number of years. If, in addition to this, we take into consideration the number of surplus hands thrown upon the labour market by the check in emigration during the last two years, and by the increasing application of the steam engine to agricultural purposes, we can readily understand why the Short Service Act of 1870 enjoys a brief popularity as a means of escaping from temporary want.⁴ The Act of 1870, then, being a Short Service Act with a temporary pension, is proof to a certain extent against the objections which bear

¹ "Citizen of the World," No. LXXI.

² Report, p. xii.

³ Recruiting Commission, 1867, p. 252.

⁴ "Report of the Inspector-General of Military Prisons," 1873, pp. 11, 18.

against all other Short Service Acts, with the exception of the frequency of desertion; but it is nevertheless open to the insuperable objections I shall presently mention, to which all possible systems of voluntary enlistment are exposed.

XI. Unlimited or life service is equally objectionable from a political and medical point of view. The political objections will be found in Burke's short but exhaustive speech on the subject, delivered in 1783. The medical objections are summed up in Table E, which has been compiled from the "Army Medical Blue Book," 1872, p. 48, and shows the comparative death-rate of soldiers and civilians, per 1,000 living, at different ages.

The conclusion to be drawn from those figures and the accompanying graphic representation of them is, that the constitutions of English soldiers break up rapidly after a certain number of years' service, and that an army of men enlisted for life would eventually be largely composed of cripples and invalids.

XII. Long service has never suffered so severely from want of recruits and from desertion as short service; it is proof against the political and medical arguments before which life service justly fell in 1847; but in common with both, and indeed with every conceivable form of voluntary enlistment, it is open to three fatal objections. It can only supply us, at an enormous cost, with an army which, in point of quality, is the very worst we could raise in England, and which, numerically, is so feeble as to render it impossible for us either to defend the country successfully in case of invasion, or to play a fitting part in any continental war in which we may be involved.

XIII. During the year 1871 the number of recruits inspected in the United Kingdom was 36,212. "The rejections on primary inspection amounted to 10,836, and on secondary inspection to 1,178."¹ In other words, about nearly 1 man in 3 was rejected. And what were the causes of these numerous rejections? The ratio per 1,000 for syphilis was 16; muscular tenuity and debility, 45; disease of the eyes, 45; disease of the heart, 26; disease of the veins, 18; loss of teeth, 12; hernia, 15; varicocele, 18; defects of the lower extremities, 16; and for malformation of the chest and spine, 26.²

"Taking the results of all the examinations," says the compiler of the Blue Book, "there has been a marked increase in the rejections for muscular tenuity and debility * * * and a notable decrease in varicose veins, defects of the lower extremities, and malformation of the chest and spine."³

In 1872, 8,990 recruits were rejected out of 28,390.⁴

"The most noteworthy change in the causes of rejection," says the compiler of the Blue Book, "is the increase in the ratio of rejections for muscular tenuity and debility, which in 1871 was much above the average of former years, and is now (1872) nearly double that average."⁵

Why have so large a number of men been rejected for such causes as those enumerated above? Because we are compelled now, and have always been compelled in emergencies, to enlist largely from town recruits of immature age.

¹ "Army Medical Blue Book, 1871," p. 37.

² Ibid., pp. 40, 41, 42.

³ Ibid., p. 43.

⁴ Ibid., 1872 (the last published), p. 49.

⁵ Ibid., p. 53.

We have ample evidence to show that town recruits were physically inferior to country recruits in the time of the Roman Empire.

"Fortior miles ex confragoso venit," says Seneca; "segnis est urbanus et verna. Nullum laborem recusant manus quæ ad arma ab aratro transferuntur; in primo deficit pulvere ille unctus at nitidus."¹ "It has never been doubted, I believe," says Vegetius, "that country folks are best adapted for carrying arms."² Experience proves that town recruits are still inferior physically to country recruits. In 1871, "the highest proportion of primary rejections (of recruits by the medical examiners) took place, as in the preceding year, at Manchester, Portsmouth, and Glasgow, and of secondary at Manchester, Birmingham, and Liverpool."³ In 1872, "Manchester, Glasgow, Portsmouth, and Bristol furnished the highest ratio of rejections on primary inspection, and Manchester and Birmingham the highest on secondary inspection."⁴

Notwithstanding all this, we are compelled by necessity to enlist largely in cities. Of the total number of recruits inspected medically in 1871, 20·5 per cent. were inspected in London;⁵ and in 1872, 31·7 per cent. of the men raised in the United Kingdom were enlisted in London alone, and 52 per cent. were enlisted in London, Manchester, Birmingham, Liverpool, and Glasgow.⁶

"Of late years," said Mr. Wyndham in 1806, from his place in the House of Commons, "our only resource has been recruiting boys. Men grown up, even with all the grossness, ignorance, and improvidence incident to the lower orders, are too wary to accept our offers; we must add to the thoughtlessness arising from the situation the weakness and improvidence of youth."⁷ Very similar in substance are the words of the Recruiting Commissioners of 1859. "Although authority was given, nearly three years ago, in consequence of the mutiny in India, to raise an additional number of 65,000 men, and although, in order to facilitate that operation, the bounty was increased, and the standard—as is unavoidable when so many men are required—was lowered to such an extent as to bring boys instead of men into the ranks, the establishment of the army is not quite complete."⁸

In 1871, 18·1 per 1,000 recruits enlisted were under seventeen years of age, and 576 were under twenty.⁹ The corresponding figures in 1872 were 27 and 582·3.¹⁰

It appears that we enlisted fewer boys in 1873 than in 1845. "In 1845, out of 1,000 recruits, 750 were under twenty years of age, whereas in 1873 there were only 580 per 1,000."¹¹ Unfortunately, the boys of seventeen we enlisted in 1845 "were superior in *physique*" "to the majority of the recruits of eighteen we are now accepting."¹² As a proof of this, Dr. Adams gives a table of heights for 1845 and 1873, which I have supplemented, in Table F in the Appendix, by a

¹ "Epist." 51.

² "De Re Militari," p. 4.

³ "Army Medical Blue Book," 1871, p. 38.

⁴ Ibid., 1872, p. 49. The reason is palpable. "Almost every class of artificers is subject to some peculiar infirmity, occasioned by excessive application to their peculiar species of work." "Wealth of Nations," i. 86, Rogers' ed.

⁵ "Army Medical Blue Book," 1871, p. 38.

⁶ "General Annual Returns," 1874, Table 13.

⁷ Alison's "History of Europe," vi. 108, note.

⁸ "Report of the Royal Commission on Recruiting," 1861, p. 3.

⁹ "Army Medical Blue Book," 1871, p. 43.

¹⁰ Ibid., 1872, p. 53.

¹¹ Dr. Leith Adams, F.R.S., on "The Recruiting Question," in the *Journal*, R.U.S. Institution, vol. xviii., No. 76, p. 62.

¹² Ibid.

column showing the heights some fifty years ago, as given by Mr. Brent, F.S.S., in Marshall's "Military Miscellany," p. 89.

The next Table, G, showing the comparative weights of the recruits in 1871 and 1872, is compiled from the Medical Blue Books of those years.

These figures fully warrant Dr. Adams in concluding that

"we have been driven more or less to select soldiers from among a class of the population notorious for containing elements of physical degeneracy. * * * There is altogether a want of vigour 'in the city boy-recruit,' and that healthy promising aspect which should characterise a youth of his years."

The increase of these manikins in the ranks of the Army had already excited attention in 1872.

"There are a large number of men, or rather lads, now in the service," wrote Dr. Tuffnell in that year, "who must break down if put to the hard work and heavy exertion inseparable from war. Many of those who have been under confinement during the past twelve months have been weakly and ill-framed, without muscle, bone, or courage, crying like women in their cells. An inspection of every regiment, each man stripped naked as they are upon admission into prison, would, I feel assured, exhibit many individuals in the ranks who are never likely to become efficient soldiers."¹

The Inspector-General of Military Prisons refers to this matter in his Report, 1873:—

"The extracts from the report of the medical officer of Millbank," he says, "will show that many of the men admitted had to be exempted from hard labour on the ground of original defects of development, feebleness of frame and constitution, and a tendency to chest affections."²

It seems to me, then, that Dr. Adams is completely justified in inferring from these facts,—

"that the number and quality of recruits have been steadily decreasing of late years, more so since the introduction of short service, and the doing away with pension and bounty on enlistment * * * the *physique* of our Infantry is not at present up to the standard of our race; and I cannot conceal from myself a feeling that, unless remedial measures are adopted, it will sink lower and lower. This conclusion has been arrived at mainly from my personal inspection of about 25,000 recruits, over 17,000 of whom have been passed into the army."³

This evidence of a medical officer, who can have no possible interest in playing the part of Cassandra, would, in my mind, be conclusive, even if it were not backed up by the testimony of almost every Artillery and Infantry officer in the Army. The Cavalry still get fair recruits; but these respectable lads soon discover the mistake they have made in enlisting, and they are not slow in endeavouring to repair it. The mean rate of desertion for five years (1868-72) was 27·4 in the Cavalry, against 22·6 in the Artillery and 20·6 in the Infantry.

The moral qualities of our present soldiers may be judged of from tables H and I.

It will be observed that the system of discharging notorious bad characters has done little to diminish crime.

It may be said that the returns of courts martial show a very decided

¹ "Report of Inspector-General of Military Prisons, 1872," p. 15.

² *Ibid.*, 1873, p. 5.

³ *Journal*, R.U.S. Institution, vol. xviii. No. 76, p. 64.

diminution, and that consequently crime is diminishing in the Army. I admit the fact, but I deny the conclusion. The diminution in the number of courts martial is due to three obvious causes.

The first cause is the system of fining for drunkenness. Table J shows the number of courts martial for habitual drunkenness from 1865 to 1868. Very naturally, when fining for drunkenness was substituted for trial by court martial, the number of courts martial diminished.

The second cause is, that the men are more immediately governed by the officers than they used to be.

The quality of the non-commissioned officers must vary with the quality of the men from among whom they are selected. The quality of the men is deteriorating, and consequently the non-commissioned officers are less efficient than they used to be. The command of the men has, therefore, been thrown more and more upon the officers, and the result has been a certain diminution of crime, because men always obey officers more readily than non-commissioned officers.

The third cause is the increasing mildness of our rule. Every month, scores of men are dealt with regimentally, who fifty, even twenty years ago, would have been tried by court martial.

As to the intellectual qualities of the recruits, the number who can read and write is necessarily increasing year by year, in consequence of the progress of education in the country generally. For the education of those who are illiterate, Government spends annually a large sum on Army schools. This amounted in 1872 to £139,400; in 1873 to £133,900; and in 1874 to £135,200.

The inevitable conclusion forced upon us by these facts is that physically, morally, and intellectually, our Army is the worst we could raise in England.

It may be objected that my facts exclusively relate to our soldiers of the present moment, and that their degeneracy, physically, morally, and intellectually, is entirely due to the Short Service Act of 1870.

In the first place, I deny that my facts exclusively relate to our present soldiers.

In the second place, while admitting that the Short Service Act of 1870 may have to some extent accelerated the downward progress of the voluntary system, I deny that it has done more. The progress of industry, not an Act of Parliament, is the true cause of the decay of the voluntary system.

The tendency of the voluntary system to absorb the dregs of the people, showed itself universally throughout Europe from the very infancy of standing armies.

"Les volontaires," says Machiavelli, who wrote in the latter part of the fifteenth century, "ne sont pas les meilleurs d'une province, au contraire ce sont les pires; parceque s'il y en a de scandaleux, de fainéants, de réfractaires, de libertins, d'échappés de la maison paternelle, de blasphémateurs, de joueurs, en un mot, de mal élevés, ce sont ceux-là qui veulent aller à la guerre, et tous ces défauts font une forte méchante milice."¹

"If all infamous persons, and such as have committed capital crimes, heretics, atheists, and all dastardly and effeminate men," wrote Bruce in 1717, "if all these, I say, were weeded out of the armies that are at present on foot in Europe, it's

¹ French Trans. of his "Art of War," p. 42.

much to be feared that most of them would be reduced to a pretty moderate number."¹

In the middle of the 18th century, we find Frederick the Great's army composed of similar materials. Prisoners just discharged from prison and renegades of all classes formed the largest part of the Prussian army, and the most extraordinary precautions had consequently to be taken against desertion.²

The Austrian army was composed almost exclusively of serfs at this time.³

A foreign writer describes the English army at the beginning of the present century in the following words:—

"Die Engländer behielten für ihre Heerbildung die frei Werbung bei, obgleich in der Regel nur aus Engländern, recrutirten sie ihre Armee doch fortwährend wie alle Mächte während des 18 Jahrhunderts, aus dem Abschaume des Volkes."⁴

The fact that three of the regiments we sent out to the Peninsula consisted wholly of convicts, pardoned "on condition of being transported beyond the seas, or of listing themselves in the service of His Majesty in his army or navy,"⁵ is a sufficient justification for Rüstow's remark. This tendency of the voluntary system to absorb the dregs of the population is the necessary consequence of the rapid progress of industry in modern Europe.

What ever drove, or now drives, a man to enlist as a private soldier? Poverty.

"It is poverty makes men soldiers," said Defoe; "and drives crowds into the armies; and the difficulty to get Englishmen to list is because they live in plenty and ease; and he that can earn 20s. a-week, at an easy, steady employment, must be drunk or mad when he lists for a soldier, to be knocked o' the head for 3s. 6d. a-week."

We draw our soldiers from the poor, and who are the poor? Those who, under the inexorable law of Natural Selection, fail, from some physical, moral, or intellectual defect, in industrial pursuits. When industry was in its infancy, and its prizes were few, there was a large mass of the population from which recruits might be drawn. The more industry spreads, and the greater the number of its prizes, the smaller is the *residuum* from which recruits can be got, and the worse, physically, morally, and intellectually, does that *residuum* become.

In quality, then, our army is the worst that we could raise; the worst, too, at a time when Tactics are undergoing rapid changes, and each change demands a corresponding improvement in the quality of the individual soldier. Every improvement in the Mechanical Arts, every discovery in Chemistry and Metallurgy, must eventually lead to an improvement in fire-arms; and every improvement in fire-arms necessarily involves a corresponding change in Tactics. We fought in column with the old flint-musket; Brown Bess enabled us to fight in line; breech-loaders compel us to fight in skirmishing order. The new order may demand no higher physical qualifications in the soldier than were demanded by the old order of things, but it demands at least

¹ "Institutions of Military Law."

² Rocquancourt, "Hist. de l'Organisation, &c., Militaire," ii. 42.

³ Preface of Lloyd's "Hist. de la Campagne de 1756," p. 40.

⁴ Rüstow's "Geschichte der Infanterie," ii. 332.

⁵ Clode, ii. 14.

as high; and yet our soldiers are degenerating physically. The new order, however, unmistakeably calls for higher moral and intellectual qualities.

"The effect of the invention of breach-loaders," says General Sherman, "is, that companies and battalions will be more dispersed, and the men will be less under the immediate eye of their officers; and therefore a higher order of intelligence and courage on the part of the individual soldier will be an element of strength. * * * The more we improve fire-arms, the more will be the necessity of good organisation, good discipline, and intelligence on the part of the individual officers and soldiers."¹ "The truth made manifest at Sadowa and Sedan—so manifest, that those who run may read—is that moral and intellectual qualifications are elements in the strength of armies, and elements which can only be obtained when armies derive their materials from the whole range of the community from which they are drawn."²

Such are the words of a Professor of Political Economy,—words of serious import, for the moral and intellectual value of our army is as low as it could well be.

XIV. Let us now inquire into the cost of the army composed of such materials.

The Army Estimates for 1853-4, neglecting the auxiliary forces, amounted to £9,501,679, for 119,874 men. In 1874-5, the corresponding estimates amounted to £12,912,618 for 128,994 men. The total cost of each man, therefore, was £79 in 1853-4 against £100 in 1874-5. While we are thus paying £100 for the dregs of the community, the Prussians are paying no more than £42 for their average citizens.³ Is the price of our soldiers likely to increase?

The various votes of which our estimates consist may be divided broadly into two categories: first, those relating to the *matériel*, and secondly, those relating to the *personnel* of the Army.

In his chapter on the cost of defence, Adam Smith attributes the increasing expense of modern war chiefly to the increasing cost of the *matériel*.⁴ M. Comte corrects this mistake at some length in his "Philosophie Positive," and points out that the increasing expense of war is entirely due to the increasing cost of the *personnel*.⁵ A glance at the estimates is sufficient to prove that M. Comte is correct. The votes for *matériel* in 1853-4 amounted to £1,345,437, and in 1874-5 to £1,528,300. In other words, they amounted to about one-eighth of the total estimates. During the last three years they showed a marked tendency to decrease, but they cannot fall below a certain limit. Every year brings us new discoveries and inventions, which lead to improvements in explosives, rifles, and guns; and changes in guns necessitate changes in fortifications. They may vary, perhaps, from one-seventh to one-tenth of the total estimates; but whatever be the range of their variation, the loss or gain on these votes is far too small to affect seriously the total amount of the estimates, and I shall assume that these votes remain constant. The cost of the *personnel* has been steadily increasing since the introduction of standing armies. Will it continue to increase? If it does increase, it is evident that the cost of the *matériel* being,

¹ New York *Army and Navy Journal*, Sept. 1874.

² "Political Essays," by Prof. Cairnes, p. 234.

³ "Statesman's Year Book," 1874, pp. 96, 97, 100.

⁴ "Wealth of Nations," ii. 291.

⁵ *Ibid.*, vi. 62.

practically speaking, constant, the amount of the estimates will increase in the same proportion as the cost of the *personnel*.

I have already pointed out that, in consequence of the State being thrown upon the labour market for its supply of recruits, and being obliged to compete there with other employers of labour, the rate of the wages of labour determines the rate of the soldier's pay. Now the wages of labour have been for a long period surely, although slowly, rising, and there can be no reasonable doubt that they will continue to rise. Therefore the income of the soldier, which is governed by the labourer's wages, must rise.

It may be said that the gradual increase in the wages of labour has been only nominal, not real; the rise being due to the growing prosperity of the country at large and the consequent diminution of the value of money. This objection is tantamount to saying that the condition of the labourer has not improved for, say a century; for if the rise in his wages has been only proportional to the fall in the value of money, he is clearly no better off now than he was when Adam Smith wrote. I cannot here enter into questions of Political Economy: suffice it to state, upon the authority of an eminent political economist¹—first, that the well-being of town labourers is considerably greater now than it was a century ago; secondly, that the condition of the great majority of country labourers is better than it was then; thirdly, that the comparative condition of the small minority is a moot point, being no worse, if it be no better; and lastly, that there is a high probability that the well-being of all labourers will surely and steadily increase.

The gradual increase in the labourer's wages, then, will necessitate a corresponding increase in the soldier's income, even supposing that the improvement in the labourer's condition produces no change in the feelings with which he regards military service. But if any one historical fact is better established than another it is, that as the industrial spirit increases, the military spirit decreases, at all periods and in all climes.

"All political investigation of a rational kind," says M. Comte, "proves the primitive tendency of mankind, in a general way, to a military life; and to its issue in an industrial life. No enlightened mind disputes the continuous decline of the military spirit, and the gradual ascendancy of the industrial. We see now, under various forms, and more and more indisputably, even in the very heart of armies, the repugnance of modern society to a military life. We see that compulsory recruiting becomes more and more necessary, and that there is less and less voluntary persistence in that mode of life."²

If M. Comte's evidence be considered insufficient, let us turn to figures. Table K shows the number of adult able-bodied paupers in England and Wales from 1859 to 1873. Assuming half these adult able-bodied paupers to be males, it appears that about three times the number of men required annually to fill the gaps in our ranks are eating the bread of idleness at the public expense. It may be said that these men are idle miscreants, who betake themselves to the work-house simply from a love of idleness. Let it be granted that two-thirds of the able-bodied male paupers belong to this class, and that the remain-

¹ Professor Cairnes.

² "*Philosophie Positive*," translated by Martineau, ii. 173.

ing third are driven to the workhouse by *bonâ fide* want of work. Why do the latter prefer the workhouse (which, as everybody knows, is hateful to all respectable labourers) to the army? Because they look on the workhouse as the least of two evils. They dislike the workhouse, but they dislike the army still more. This is a good illustration of the dislike of the lower classes for military service. Tables L, M, N, and O show the kind of feeling with which those who have actually enlisted regard military service. What better proof could we demand of "the repugnance of modern society to a military life," displayed "even in the very heart of armies?" To resume: as civilisation progresses, the military spirit gives way before the industrial. The better the condition of the labourer, the greater will be his aversion to military service; and the stronger this aversion, the greater will be the inducements necessary to allure him into the ranks. The income of the soldier, therefore, has a tendency to rise in a higher ratio than the wages of labour: for, in the first place, the soldier must receive a sum which is at least equal to the wages of labour and which rises with them, as a compensation for the work he does and the risks he runs; and, in the second place, he must receive another sum, in excess of the wages of labour, which also rises as wages rise, as compensation for the declining reputation of military service. Professor Cairnes puts this very clearly:—

"The State being thrown for the supply of soldiers on the labour market, and the soldiers' vocation being, fortunately for mankind, one that with the progress of society steadily declines in public estimation, two important consequences result: first, in order to attract a sufficient supply of men to the ranks, the Government is under the necessity of constantly raising its terms—of raising them, not merely in proportion to the general advance of the labour market, but so as to compensate the declining honour into which the soldiers' trade has fallen: and secondly, the recruits, thus attracted, come more and more from the lowest and least respectable classes of the community. The system thus becomes constantly more costly; while the character of the men who fill the ranks steadily deteriorates."¹

The cost of the soldier, then, will inevitably rise, and will continue to rise. I do not mean to assert that it will rise either rapidly or continuously. It may fall next year, and the year after too. What I maintain is, that in the periods of time required for the operation of large social causes, the Army Estimates will prove an ever-increasing burden to the people of England, and that in no very distant future the burden will become altogether insupportable.

It only remains to consider the value of our Army numerically.

XV. It might be reasonably expected that our lavish military expenditure, unparalleled in history, would have at all times brought us a sufficient supply of recruits. As a matter of fact, however, the ranks of our army have seldom or never been complete, except in times of reduction. To take a few instances in the present century:—The army was 25,000 men below its establishment in 1806;² 32,314 in 1814;³ 7,949 in 1826;⁴ 7,643 in 1831;⁵ 5,737 in 1866;⁶ 9,280 in 1871;⁷ and 3,128 in 1873.⁸

¹ "Political Essays," p. 203.

² Alison's "History of Europe," vi. 112, note.

³ Marshall's "Military Miscellany," p. 350.

⁴ *Ibid.*

⁵ *Ibid.*

⁶ "General Annual Returns," 1874, Table 1.

⁷ *Ibid.*

⁸ *Ibid.*

The number of recruits, then, is insufficient; it has been so insufficient that in all our great wars, the Crimean included, Government has been obliged to employ foreign mercenaries; and for nearly a century we were driven to have recourse to limited conscription.

"The first Act directly sanctioning the employment of foreigners as "part of the military forces of the Crown was 29 Geo. II., c. 5."¹ The next was 34 Geo. III., c. 43. Not more than 5,000 of these mercenaries were permitted to be in England at one time.² The next was 40 Geo. III., c. 100, authorising the Crown to employ 6,000 Dutchmen.³ Again, the preamble of 44 Geo. III., c. 75, states that it was desirable to employ foreigners,⁴ 16,000 of whom were eventually permitted to be in England at the same time. Table P, extracted from Clode ii., 436, shows the number of foreigners in British employ from 1804 to 1813.

Finally, a force of foreigners was raised under 18 Vict., c. 2, during the Crimean war. It was a comparatively small force, and is the last that can be employed by England.

But the supply of foreigners was at all times precarious, and sometimes failed altogether. Under these circumstances the English Government was driven to its last and only resource; and it became necessary to compel the patriot citizen to serve his king and country. It is a stern fact that limited conscription was resorted to, in our free and glorious country, on almost every occasion on which troops were required from 1695 to 1781. It was limited to imprisoned debtors from 1695 to 1702;⁵ it was applied to criminals in 1702;⁶ and it was extended to paupers in 1703.⁷ Mr. Clode describes 7 Anne, c. 2, which was passed in 1708, as an Act "to stimulate voluntary enlistment under the apprehension of impressment."⁸ I prefer to call it an Act under which conscription received an unlimited extension in its application to that large and vague class—the pauper class.

"By this Act the Commissioners were first to appoint two General Meetings for Volunteers to be received and paid £4 as bounty. After these meetings impressed men were to be brought in and listed, receiving no bounty. For each listed man the reward to the parish officers was increased to £1, and the churchwardens were to receive £3."⁹

Whatever doubt there may be as to the true meaning of this Act, there can be none about the meaning of 29 Geo. II., c. 4, which Mr. Clode speaks of as "one of impressment only, not embracing voluntary offers of service."¹⁰ In plain language, conscription was put in force, under this Act, in its barest and most unmistakeable form, though it was restricted, no doubt, to men not following any "lawful calling or employment," or not "having lawful and sufficient support."

I must repeat that these conscriptions were limited, or class conscriptions. They were, therefore, both vicious in theory and tyrannical in practice, being founded upon the monstrous principle, that in

¹ Clode, ii., 432.

² Ibid., ii., 433.

³ Ibid., ii., 434.

⁴ Ibid.

⁵ Ibid., ii., 12.

⁶ Ibid., ii., 13.

⁷ Ibid., ii., 15.

⁸ Ibid., ii., 16.

⁹ Ibid.

¹⁰ Ibid., ii., 17.

emergencies some men are bound to serve their country and some are not.

It would be impossible, in the limits prescribed for this essay, to trace the progress of the laws of conscription. Suffice it to say, that although conscription for the regular army has not been resorted to since 1781, the principle that every able-bodied man is bound to serve his country in time of need was affirmed by the law of 1757, 30 Geo. II., c. 25, which authorised the Crown, in certain emergencies, to recruit the militia by ballot¹—a law, which with more or less modification, has been in force up to the present moment.

"Even now," says Professor Cairnes, "the permanent law of the country requires that everyone (with specified exceptions) shall, if called upon, venture his body in the Militia, and only fails of being enforced through the enactment of an annual Act suspending the Militia ballot."²

It may be urged that, granting the great difficulty of getting recruits, it is a difficulty which has always existed, and is no greater now than it ever was, as is proved by my own figures. This is not so. Admitting, for the sake of argument, that the number "wanting to complete" did not materially increase between 1851 and 1871, the difficulty in getting recruits can only be said to have remained the same by assuming the number of men available for recruits in the United Kingdom to have been constant during that period. But this assumption is quite untrue.

"If there was a conscription of young men at twenty," wrote the Census Commissioners of 1871, "the annual contingent furnished by England and Wales would be about 207,943, who, if they continued under the flag five years, would amount to 1,017,862. * * * The number living is continually increasing: thus the number of young men attaining the age of twenty in 1851 was 171,812, and 207,943 in 1871; so if the recruiting staff does not get volunteers in that proportion, it is not for lack of men, but of inducements to serve."³

But, even supposing our establishment to be complete, is that establishment sufficient to maintain the position—to say nothing of the honour—of England as one of the great European Powers?

On the 1st January, 1873, our Army numbered 194,227 officers and men. But where were they? There were 62,834 in India; 1,373 on their passage from India; 23,590 in the Colonies, and the remaining 103,618, of whom 62,334 were Infantry, at home. Thus the grand result of our expenditure of some £15,000,000 was, that the safety of the British Islands was staked upon an army of less than 60,000 Infantry. What of our ancient constitutional force, the Militia, it may be asked, forming, as it does, a reserve of 120,000 men? I never hear of the Militia without thinking of Dryden's description of the trained bands of his times:—"In peace a charge, in war a weak defence." Officered, instructed, and disciplined as it is, the Militia is not a reliable force now; and it can never become so, for the simple reason that it is raised, like the army, on the voluntary system. I may be reminded, too, of our Yeomanry Cavalry. I would as soon believe in the transmutation of the metals as in the transmutation of a civilian into a Cavalry

¹ Clode, i., 39.

² "A National or a Standing Army?" in "Political Essays," p. 231.

³ "Report of the Census, 1871," p. 12.

soldier by means of eight days' training in the year. But we have 180,000 citizen-soldiers, it may be urged. I know something of the Volunteers, and my conviction is, that the only end gained by supporting them is the gratification of our national vanity. Not long ago an Austrian officer irreverently described them as "a harmless joke."¹ They may be a joke, but they are certainly not a harmless one, for they are filling the country with an army of mock colonels and majors who, if an invasion did take place, would cause incalculable harm by the tenacity with which they would cling to their relative rank.

Finally, we have no reason to place any trust in such a Reserve as that now being formed. In the first place, the practical difficulty of collecting the men, in a country socially organised like England, would be enormous. Secondly, the great majority of the men have avowedly a distaste for military service, and not half of them, probably, would obey the summons to muster. Lastly, the military value of the fraction of the Reserve which we might succeed in collecting would be *nil*, for owing to the impossibility of organising regular annual drills and exercises for such a force, and also to the constant changes in military manœuvres, the men who answered the call and rejoined the colours would be little better than raw recruits. They would come together ignorant of each other, of their non-commissioned officers, and of their officers; and for a considerable time they would be no better than a military mob, which, as Lord Macaulay says, is the worst of all mobs.

I need hardly say, that the direct consequence of our want of Reserves is, that in case we became involved in hostilities we should be obliged to fill up the gaps in the ranks of the army in the field with raw recruits. "The reinforcements we are getting," wrote Sir John Burgoyne, from the trenches round Sebastopol, "consist of a vast number of recruits. . . . I think that we are better without numbers than that they should be so composed."²

XVI. I sometimes think that Bishop Butler's theory of national fits of insanity must be true, and that we English are gone mad upon the subject of our national defences. For surely it is sheer madness to risk our liberties in times like the present upon the success of an army of 60,000 infantry. In Marlborough's, in Wellington's time, such a force might have proved sufficient for our needs, but at present it is utterly unfit to fulfil its *raison d'être*, for we live in times when heaven favours big battalions more than ever it favoured them. "The new weapon," said Sir William Napier, speaking of the Enfield rifle, "will be all in favour of superior numbers."³ Our present weapon is still more in favour of superior numbers, and superior numbers we never have had, and never can have with a voluntary system of enlistment.

Let us hear the conclusion of the whole matter in the words of Professor Cairnes:—

"The capital fact of the case is that the method of warfare has been changed.

¹ Streffleur's "Oesterreichische Militairische Zeitschrift," for May, 1874, p. 166.

² "Life and Letters," &c., ii. 206.

³ "Life," &c., ii. 378.

The struggle has been transferred from standing armies to armed populations; and until we recognise this fact, and adapt our defence to the altered circumstances, our position cannot be other than precarious. * * * It may be that warfare carried on by entire populations is 'essentially retrograde'; but retrograde or not, this is the danger against which we have to provide. And it seems to me there would be as little solace to our dignity as compensation for our suffering, on finding ourselves the victims of combinations we might easily have foreseen, to reflect that we had only made our preparations against more civilised methods of attack. * * * In very truth it signifies little whether our present method of recruiting be effectual or not; for were we thus to obtain an army numerous enough for our purpose, the expense of such a force, maintained on the principle of a standing army of the English pattern, would be simply ruinous. Our entire revenue applied exclusively to military purposes would not suffice for the drain; and we might as well be crushed at once by the enemy as ruined by the slow torture of the taxgatherer. And I venture to go further still. Even though the needful force could thus be raised, and the means of supporting it were forthcoming, what just confidence could be placed in an instrument of the quality which alone such a process could give us? The system remaining the same, the character of the men composing our army would continue to be what it now is; and we should thus, in the last resort, have to stake our national existence on a struggle in which the *prolétaires* and the pariahs of our community would be matched against the average citizens of other states."¹

The voluntary system of recruiting never was a success, and day by day it must prove a greater and a greater failure. The reader may perhaps remind me of the glories of the past. If he points on the one hand to the records of our victories, I point on the other to the records of our national debt. With a better system of recruiting, we might have won the same victories at one-third of the expense. Prussia's motto is "Blut und Eisen"; "Blood and Gold" is England's. But gold is a dangerous metal to put one's whole trust in. "Solon said 'well to Cresus (when in ostentation he showed him his gold), 'Sir, 'if any other come that hath better iron than you, he will be master 'of all this gold.'"²

PART II.—ON SYSTEMS OF RECRUITING IN GENERAL.

I. There are only four possible systems on which recruiting can be carried on; the voluntary, the mercenary, the vicarious, and the compulsory.

II. In Part I. I have endeavoured to prove that it is hopeless to expect a good army from the voluntary system, either now or at any future time.

III. It would be impossible, in the present political state of Europe, for any country to maintain an army of foreign mercenaries.

IV. The recent rejection of the vicarious system by the French is, in my mind, a sufficient argument against its adoption elsewhere, even were we ignorant of the facts of the case. But we are well acquainted with the facts of the case, and they, one and all, prove the vicarious system is a splendid sham.

On the 20th August, 1793, the first "levée-en-masse," or universal conscription, known in modern history was voted by the French National Assembly.³ Universal conscription was declared the recog-

¹ "Political Essays," pp. 219, 222, 223.

² Bacon's "Essay on the true Greatness of Kingdoms and Estates."

³ "Les Institutions Militaires de la France," par M. le Duc d'Aumale, p. 53.

nized system of enlistment in 1798, and substitution was forbidden. Substitution, however, made its appearance the very next year.¹ The history of substitution from that year until 1855 is best told in the words of the French Committee on Recruiting, 1871.

"As luxury spread in France, and new pursuits were opened up for young men, they seemed less ambitious of following the profession of arms; the number of substitutes increased, and the means employed to obtain them occupied public attention, and more than once motions on this subject were introduced into the Chambers."²

In 1855 the law of dotation put an end to substitution. The only difference between substitution and dotation was this; that under the former system a man designated for military service was allowed to pay another to serve in his stead, while under the latter a man could buy him himself off military service altogether, and thus compel the State to provide another in his place, if another was wanted. Substitution was bad; dotation was worse; and under both systems conscription was a mere name, for both virtually did away with personal service. In 1865-66, "the number of that portion of the army not furnished by the conscription had risen to 283,000, of which number 164,000 were Government substitutes—men engaged or re-engaged for money."³ To such a pass had things come, indeed, that private companies were formed to insure their subscribers against "fire, inundations, storms, and military service."⁴

Owing chiefly to Trochu's indignant protest, dotation was abolished in 1868; but substitution reappeared, and exchange of lots was allowed. Then came the war, and with the war, defeat. But, as the French Committee tell us, "Great disasters carry with them much instruction. It is wise to understand them; it is courageous to profit by them."⁵ The realities of war dispelled the illusions of peace; the Committee on Recruiting perceived clearly that "the question of substitution is truly 'the question of compulsory service';"⁶ and acting upon this principle they established as the system of recruiting universal conscription, without substitution or dotation.

It is evident that the necessary effect of the French, or vicarious, system is the elimination of the best classes from the ranks.

"A mesure qu'un plus grand nombre de familles arrivent à l'aisance, le chiffre des exonérations augmente, et l'armée ne se recrute plus que dans les dernières classes de la population."⁷

Such was the result in France; such, too, was the result in Belgium.

"In 1866, as we are informed by M. Fourcault,⁸ the proportion of substitutes formed no less than a fourth of the whole annual contingent—a proportion more than double what it had reached ten years before."⁹

¹ "The Law of Recruiting," translated from the French by Capt. Home, R.E., p. 4.

² Ibid., p. 7.

³ Ibid., p. 8.

⁴ Trochu's "L'Armée Française en 1867," p. 59.

⁵ "The Law of Recruiting," p. 1.

⁶ Ibid., p. 23.

⁷ "La Prusse et l'Autriche depuis Sadowa." Par M. de Laveleye, i. 74.

⁸ "Annales de l'Association Internationale: Congrès de Berne," 1866, p. 602.

⁹ Prof. Cairnes' "Political Essays," p. 215.

Such also was the result in England on one of the first occasions on which the ballot for the militia was enforced.

"The principle of substitutions led to this result," says Mr. Clode, "that few *but substitutes* were to be found in the ranks. The evil did not, however, terminate here; for temptation to procure another high bounty by another substitution led to a large amount of desertion. The returns laid before Parliament, under the Army of Reserve Act, showed that out of the 45,492 men raised for the United Kingdom in the years 1803-4, by the operation of the ballot, 40,998 were substitutes, and further that in one year the force was reduced by desertion and death by 8,106 men."

The deaths only numbered 599. Similar results were shown at a later period.

"From returns laid before Parliament in March, 1808, it appeared that, of 26,085 raised since the 14th August preceding, 22,956 men were substitutes, only 3,129 being principals."¹

A vicarious army, then, is a mere sham. A conscription in name, in reality it degenerates into a voluntary army, composed of substitutes bought at a great price. The men composing it belong "almost exclusively to a single class, and that the lowest of the nation;"² it gives rise to an incalculable amount of desertion; and it renders impossible the formation of large and reliable reserves. The French have rejected it, and wisely rejected it, as a perusal of Captain Home's translation of "The Law of Recruiting" will prove. To adopt it in England would be to make our last state worse than our first.

V. Nothing remains for us, then, but universal conscription, without substitution or dotation; a system which will furnish us with a first line and large reserves, composed of the flower of our population, at about one-third of the cost of our present army.

VI. It may be said that conscription is unnecessary, for two reasons.

The first is, that the wages of labour are rising. High wages mean early marriages, and early marriages mean a redundant population, which will furnish an ample supply of recruits. This is tantamount to saying that the condition of the labourer can never improve—an objection I have met before.

The second reason is, that the collapse of the voluntary system is owing to the mal-administration of "the authorities"—meaning, I presume, the Commander-in-Chief and his staff. His Royal Highness has about as much to say to the collapse of the voluntary system as the Tycoon of Japan. Its collapse is due purely and entirely to the progress of the industrial spirit in the country, and the corresponding changes in the conditions of society; and if we are to remain what we now are, a great and free people, we must adapt ourselves and our institutions to these new conditions. We were the last nation in Europe to raise a standing army. We fought long and resolutely against it, but we were at last compelled by the force of circumstances to give in. We are the only great power in Europe that does not maintain a compulsory army, and we shall, no doubt, fight resolutely and long against it. But we shall be compelled to give way; conscription is inevitable. Let us yield to the arguments of common sense, rather than to the brute force of some great calamity.

¹ Clode, i. 291.

² Professor Cairnes' "Political Essays," p. 216.

VII. Again, it may be said that conscription will injure the commercial prosperity of the country, by absorbing a larger amount of useful labour than the voluntary system.

In the first place, conscription, in its worst form, would hardly do more harm to our commerce than one serious reverse to our arms would cause.

In the second place, I doubt if conscription would absorb a greater quantity of labour than our present system. The quality of the labour would no doubt be higher; but let us ponder over the words of the French Commission on organisation:—

"The army is the annual premium of insurance against foreign invasion and dismemberment of territory. You cannot diminish the premium without diminishing at the same time the safeguards of the country. Forgetfulness of this fact cost us two of our most patriotic provinces and five milliards."¹

VIII. It may be urged that conscription will retard our political progress by interfering with individual liberty.

"The very existence of a nation as an organised community," says Professor Cairnes, "is founded upon the recognition of duties obligatory upon all, and which the State may at need enforce."²

What duties can the State demand from every member of society, without trenching upon individual liberty? Let us take the answer to this question from a book advocating so great an extension of individual liberty, that the practical adoption of its principles, we have often been warned, would lead to revolution and anarchy.

"Every one who receives the protection of society owes a return for the benefit, and the fact of living in society renders it indispensable that each should be bound to observe a certain line of conduct towards the rest. This conduct consists, first, in not injuring the interests of one another, or rather certain interests, which, either by express legal provision or by tacit understanding, ought to be considered as rights; and secondly, in each person's bearing his share (to be fixed on some equitable principle) of the labours and sacrifices incurred for defending the society or its members from injury and molestation. These conditions society is justified in enforcing, at all costs to those who endeavour to withhold fulfilment."³

IX. Finally, it may be urged that the people of England "won't stand" conscription. Perhaps not,—at present. But conscription is coming upon us with sure, although slow foot.

If peace lasts long enough, we must eventually reach a time when the cost of an army, unfit for the operations of modern war, will be a burden no longer tolerable.

If war breaks out, we shall have to choose between conscription on the one hand, and defeat and humiliation on the other. Our house is founded upon the sands, and when the storms of war descend upon it, it must fall, and great will be its fall.

Conscription is inevitable.

X. It may be urged that, even if conscription were accepted by the people of England, a considerable time would necessarily elapse before it could be introduced into the army, and it may be asked what we are

¹ "General Organisation," translated from the French by Major C. B. Brackenbury, R.A., p. 3.

² "Political Essays," p. 230.

³ Mill's "Essay on Liberty," p. 44, People's Ed.

to do in the meantime. We have two things, and only two things to do.

In the first place, we must raise the soldier's pay, which, as Table Q shows,¹ was less than the labourer's pay in 1869, and is considerably less than the labourer's pay now, by such an amount as will compensate, not only for the work and risk a soldier undergoes, but also for the declining estimation in which the Army is held by the labouring classes. And how, it may be asked, is this amount to be practically ascertained? Simply by going into the labour market and saying to the labourers, "If you won't come for the "pay and pension we offer you, what will you come for?" and by giving what they ask. In the second place, we must devise some equitable scale of payment for the different arms of the service. From a number of calculations I have made, I find that a Cavalry soldier does half again as much work in a given time as an Infantry man. Yet the latter receives 1s. a day pay, while the former receives only 1s. 2d. This crying injustice brings its own reward:—the desertion from the Cavalry is considerably higher than that from the Infantry. Irregular and capricious as the rate of desertion from the different branches of the service may seem at first sight, it obeys a very simple and intelligible law. The rate of desertion is proportional to the amount of work done in a given time, divided by the amount of pay received for that time. In general terms, if W and P be the amount of work done and pay received, in a given time, for one branch of the service, and D the average rate of desertion; and if W' , P' , and D' , be the corresponding quantities for another branch of the service,—then

$$\frac{W}{P} : \frac{W'}{P'} :: D : D'.$$

As an example, let the work done by an Infantry soldier in one day be unity. Then, since his pay is 1s. per diem, the value of the fraction representing his work divided by his pay, is unity. The comparative value of a Cavalryman's work would be 1.5 and this, divided by his pay, 1.16 shillings per diem, is 1.29. Now, 1.29 is to 1, as 1 is to 0.76, or as 27.4 is to 20.8; which was almost exactly the comparative mean desertion of the Cavalry and Infantry for the five years 1868-72.² This is a sufficient confirmation of the law I have pointed out.

It may be said that the desertion from the Artillery does not conform to this law. I reply that the figures representing the desertion from the Royal Artillery in the General Annual Returns represent nothing whatever. They are the averages of the desertion of the Field Batteries and Horse Artillery on the one hand, and the Garrison Artillery on the other; and as such they represent an imaginary rate of desertion, at which no Branch, Brigade, or Battery of Artillery deserts. We learn no more from these figures than we should learn from being told that the average height of the houses in a certain street was 50 feet,³ or that the average height of two men was 5 feet 6 inches. In the first case,

¹ Extracted from Clode, vol. i. p. 489.

² "General Annual Returns," 1874, Table 22. The exact proportion is 27.4 to 20.6.

³ I borrow this illustration from Venn's "Logic of Chance."

not a single house in the street might be within 20 feet of the average: in the second, the respective heights of the two men might be 5 feet 8 inches and 5 feet 4 inches, or 6 feet and 5 feet nothing. The desertion from the Artillery, however, forms no exception to the law I have pointed out. From the Police Returns of Deserters I find, that Field Artillerymen desert more than Cavalrymen. Why? Because, while the pay is virtually the same for the two arms, the Artillery have the hardest work. Again, the Garrison Artillery desert less than the Infantry. And why? Because while the work in both cases is the same, the gunner receives 2*d.* a-day more pay than the private. Nothing, then, can be more misleading than the averages representing the desertion from the Artillery in the General Annual Returns. According to them, the desertion of the Artillery is considerably less than that of the Cavalry, and somewhat more than that of the Infantry; while as a matter of fact, the Horse Artillery and Field Batteries desert more than the Cavalry, and the Garrison Artillery desert less than the Infantry.¹

PART III.—ON A PLAN OF UNIVERSAL CONSCRIPTION FOR THE ENGLISH ARMY.

I. As the best, and indeed the only possible, mode of providing recruits and forming reserves for the British Army, taking into consideration its varied duties in peace and war, I propose a home army, raised upon the principle of conscription in its most rigid form, without substitution or dotation, and an Indian and Colonial army maintained on the best form of the voluntary system—long service, with pension.

II. It may be said to be a monstrous contradiction, first to prove the voluntary system to be a failure, and then to propose a voluntary army for India and the Colonies. I reply, in the first place, that we have no choice in the matter. A conscript army is necessarily a short service army, and with such an army it would be practically impossible to organise a system of Indian and Colonial relief that would work. In the second place, by restricting the voluntary system to India and the Colonies, the value of one of the greatest objections to the voluntary system—its cost—is reduced to a minimum; while that of another—desertion—is reduced almost to zero. The force in India is roughly about one-third, that in the Colonies about one-eighth of the whole British Army. If conscription were adopted for the home army, therefore, the Imperial treasury would only have to provide for one-eighth, instead of two-thirds of the whole army on the voluntary system. As to desertion, it would be almost wholly got rid of.

"It appears," wrote the Royal Commissioners on Desertion in 1859, "that desertion is wholly confined to the United Kingdom, and the North American and Australian colonies. * * * At other stations, such as India, the West Indies, and the Mediterranean garrisons, desertion is very rare indeed, the proportion lost annually being little more than 1 per 1,000."²

¹ It is but right to say that these conclusions are drawn from partial facts. I believe, however, that they are closely approximate to the exact truth.

² "Report," &c. 1861, p. xii.

III. The home army of conscripts I propose to be divided into a first line, and a first and second reserve. What the strength of the first line and reserves should be I do not pretend to say.

As every man, according to my proposal, would be liable to military service, the annual supply of conscripts would far exceed our needs. The number required would be obtained by raising the standard of physical, and moral, and possibly intellectual efficiency, and by a judicious system of exemptions.

I propose the period of service in the first line to be one year.

Ten thousand military voices will, I know, exclaim—the experience of ages proves that you cannot make an Infantry soldier in one year.

In reply, I beg to say that we have no experience whatever in the matter. Our experience is entirely confined to the length of time required to make the lowest and worst members of the community soldiers. If they can be made soldiers in two years, there is no reason to believe that conscripts representing the whole mass of our population could not be made efficient in one year. The discipline would have to be rigid, no doubt, and the drill never-ending; but if the system were carried out with a will, no sane man can doubt its ultimate success.

As to the length of service in the reserves, I make no proposal.

Table R shows the manner in which Conscription might be introduced.

I have supposed, but do not propose, that the first line should consist of 100,000 men, and each reserve of 200,000. The latter would be called out for training each year for a certain time.

Conscription would be tried as an experiment, under chosen officers and non-commissioned officers, the first year, say 1877. Conscription would be again experimentally tried in 1878, 10,000 conscripts, only, being called out the first year, and 20,000, only, the second. I have supposed, but do not propose, that the conscripts pass their twentieth year in the first line.¹ As to the rate at which our present army and so-called reserves might be permitted to diminish, and other details, I trust the table is sufficiently explanatory.

IV. Such is the system I propose of providing recruits and forming reserves for the British Army, taking into consideration its varied duties in peace and war. It is the best means of doing so; it is the only means of doing so. Conscription may be unwelcome to the officers of the army, it may be irksome to the poor, and it may be hateful to the rich; but conscription is inevitable, because it is a logical and necessary consequence of the industrial progress of modern Europe.

¹ The age at which a man would join the colours would have to be determined by the nature of his profession or employment.

APPENDIX.

TABLE A.—SHOWING THE COST OF PENSIONS AT VARIOUS TIMES.

Clode's "Military Forces of the Crown," ii, 281, 781; "Statesman's Year Book,"
1874, p. 229.

	£
Cost of Pensions, 1806 (before Wyndham's Act).	181,402
Ditto, 1806 (after Wyndham's Act).....	379,642
" 1816	707,575
" 1826	1,372,330
" 1828	1,437,756
" 1853	1,219,299
" 1868	1,251,100
" 1872	1,291,200

TABLE B.—SHOWING THE PERIODS OF SERVICE UNDER WYNDHAM'S ACT,
1806.

Clode's "Military Forces of the Crown," ii, 286.

	Infantry.	Cavalry.	Artillery.
	Years	Years	Years
First Period	7	10	12
Second "	7	7	5
Third "	7	7	5
Total	21	24	22

THE ONLY ANSWER TO THE RECRUITING QUESTION. 121

TABLE D.—SHOWING THE RATE OF DESERTION AT DIFFERENT PERIODS OF SERVICE.

"Blue Book of Royal Commission on Recruiting," 1867, p. 252.

Year.	Under 6 Months' Service.	Under 1 Year's Service.	Under 2 Years' Service.	3.	4.	5.	6.	7.	8.	9.	10.
1859..	2,820	1,220	1,251	141	281	289	101	57	33	20	13
1860..	2,272	1,034	1,319	1,040	165	284	321	102	50	41	30
1861..	1,172	829	938	731	539	107	220	226	83	40	36
1862..	477	316	577	533	429	469	110	149	194	60	26
1863..	529	312	385	548	512	459	395	85	147	176	71
1864..	706	494	400	260	372	349	337	362	54	133	180
1865..	791	581	549	279	210	336	319	340	325	66	184
Total	8,767	4,786	5,419	3,533	2,508	2,293	1,803	1,321	886	536	540

Year.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	Not Known	Total.
1859..	9	13	27	9	8	3	6	6	9	5	6	3	—	6,330
1860..	23	9	28	34	28	15	11	9	7	1	6	6	31	6,867
1861..	25	20	16	21	17	11	9	7	8	6	4	4	15	5,084
1862..	17	13	6	8	4	11	9	22	3	5	3	1	6	3,448
1863..	23	22	3	6	5	7	9	10	3	4	2	3	11	3,727
1864..	52	27	21	11	7	6	9	11	3	4	—	1	6	3,805
1865..	173	46	26	16	3	2	5	6	5	4	2	2	17	4,287
Total	322	150	127	105	72	55	58	71	38	29	23	20	86	33,548

TABLE E.—SHOWING THE COMPARATIVE MORTALITY OF SOLDIERS AND CIVILIANS, PER 1,000 LIVING, AT VARIOUS AGES.

"Army Medical Blue Book," 1872, p. 48.

	Under 20 Years of Age.	20—25	25—30	30—35	35—40	40 Years and upwards.
The Guards, Cavalry, Royal Artillery, and Infantry (exclusive of all Depôts), 1861-72, inclusive	2·84	5·53	6·43	12·24	17·54	24·03
Civil Male Population, England and Wales	7·41	8·42	9·21	10·23	11·63	13·55
Civil Population, Healthy Districts ..	5·83	7·30	7·93	8·36	9·00	9·86

GRAPHIC REPRESENTATION OF THE ABOVE TABLE.

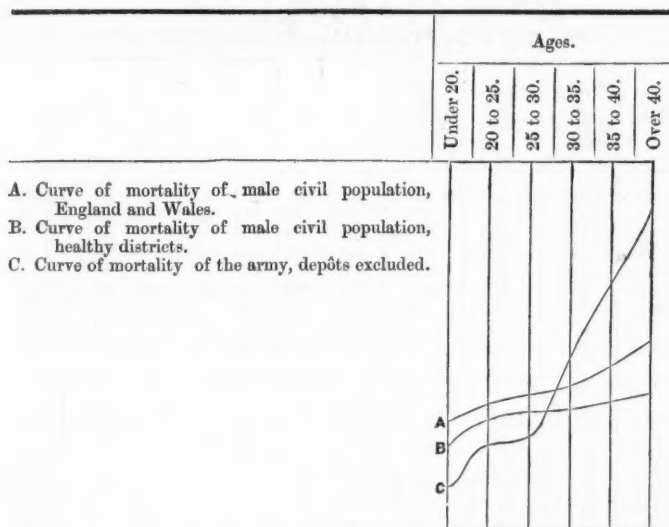


TABLE F.—SHOWING THE COMPARATIVE HEIGHT OF SOLDIERS AT VARIOUS TIMES.

"Journal, R. U. S. Institution," vol. xviii., No. 76, p. 62; "Military Miscellany," p. 89.

Height.		About 1820.	1845.	1873.
Feet	Inches	Ratio per 1,000	Ratio per 1,000	Ratio per 1,000
5	1	—	105	364
5	2			
5	3			
5	4			
5	5	4	—	—
5	6	114	473	433
5	7	180	204	111
5	8	252	111	62
5	9	184	74	15
5	10	123	16	12
5	11	73	17	3
6	0	40	—	—
6	1	15	—	—
6	2	7	—	—
6	3	1	—	—
6	4	1	—	—
6	5	1	—	—
		1,000	1,000	1,000

THE ONLY ANSWER TO THE RECRUITING QUESTION. 123

TABLE G.—SHOWING THE COMPARATIVE WEIGHT OF RECRUITS, 1871, 1872.
“Medical Blue Book,” 1871 and 1872,

Proportion per 1,000 Examined.		Primary Inspections.	
		1871.	1872.
lbs.	lbs.	Ratio per 1,000	Ratio per 1,000
Under 100	165	30.8
From 100 to 110	20.5	15.0
“ 110 “ 120	122.4	125.6
“ 120 “ 130	245.6	265.9
“ 130 “ 140	293.7	273.5
“ 140 “ 150	189.1	183.0
“ 150 “ 160	72.1	69.0
“ 160 “ 170	30.3	26.8
“ 170 and upwards	9.8	10.4
		1000.0	1000.0

TABLE H.

Compiled from Marshall's “Military Miscellany,” pp. 313, 315, 316, 350, 351.

	1831.	1832.	1833.	1834.	1835.	1836.	1837.	1838.
Ratio per 1,000 effective strength of non-commissioned and men tried for—								
Disobedience of orders ..	1.4	1.6	1.7	2.1	2.3	2.2	1.9	1.7
Insubordination	2.7	3.1	5.1	6.8	5.9	5.1	4.7	4.4
Disgraceful conduct	3.2	1.3	1.8	2.4	2.8	3.2	3.3	2.8
Drunkenness under arms	2.9	6.5	6.8	8.7	10.1	8.2	7.2	9.0
Habitual Drunkenness ..	5.5	9.2	10.5	10.8	14.2	12.8	13.2	15.9

TABLE I.

Compiled from “General Annual Returns,” 1874, Tables 7, 28, 31, and “Report of Inspector-General of Military Prisons,” 1874, p. 4.

	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.
Ratio per 1,000 average strength of non-commissioned officers and men tried for—									
Disobedience of orders.	2.1	1.4	1.0	1.3	1.8	1.1	1.4	1.4	—
Insubordination	6.0	5.8	5.7	7.9	9.6	9.1	9.0	8.4	—
Disgraceful conduct ..	3.4	3.3	2.7	3.9	4.0	4.0	3.7	3.8	—
Drunkenness under arms	8.6	6.7	7.3	8.5	9.4	7.9	7.4	6.4	—
Ratio per 1,000 dismissed with ignominy	—	—	—	—	13.2	8.9	5.3	8.8	10.7
Ratio per 1,000 fined for drunkenness ..	—	—	—	—	110.7	172.5	183.0	135.9	—

TABLE J.—SHOWING THE NUMBER OF COURTS-MARTIAL FOR HABITUAL DRUNKENNESS, 1865-1868.

"General Annual Returns," 1874, Table 28.

Years.	1865.	1866.	1867.	1868.
Number of courts-martial for habitual drunkenness	6,853	9,504	9,853	10,266

TABLE K.—SHOWING THE NUMBER OF ABLE-BODIED PAUPERS, 1859-1873.

"Statesman's Year Book," 1874, p. 243.

Years.	1859.	1860.	1861.	1862.	1863.	1864.	1865.
No.	137,418	136,761	150,526	167,646	253,499	186,750	170,136

Years.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.
No.	149,320	158,308	185,630	183,162	194,089	189,939	153,753	127,697

TABLE L.—SHOWING THE NUMBER OF RECRUITS AND DESERTERS FROM 1803 TO 1812.

Marshall's "Military Miscellany," pp. 76, 105.

Years.	By common Recruiting.	Additional Defence Act.	Volunteers from Militia.	Total.	Desertions.	Percentage of Deserters to Recruits.
1803	11,253	—	—	11,253	4,404	39.1
1804	9,430	1,658	—	11,088	5,468	49.3
1805	11,677	8,288	13,580	33,545	7,081	21.1
1806	11,875	5,834	2,968	20,677	5,748	27.7
1807	19,114	}	29,108	61,185	3,878	11.5 ¹
1808	12,963				6,611	24.0
1809	11,720				4,901	17.0
1810	9,095		23,885	44,700	4,729	18.1
1811	11,472	—	11,453	22,925	5,026	23.6
1812	14,432	—	9,927	24,359	5,918	24.2

¹ This reduction was the effect of Wyndham's Act.

THE ONLY ANSWER TO THE RECRUITING QUESTION. 125

M.—COMPARATIVE TABLE OF PERCENTAGE OF DESERTERS TO RECRUITS AT THE BEGINNING OF THE CENTURY AND THE PRESENT TIME.

Year.	Percentage.	Year.	Percentage.	Year.	Percentage.	Year.	Percentage.
1803	39·1	1808	24·0	1863	25	1868	17
1804	49·3	1809	17·0	1864	18	1869	27
1805	21·1	1810	18·1	1865	24	1870	12
1806	27·7	1811	23·6	1866	23	1171	19
1807	11·5	1812	24·2	1867	17	1872	33

TABLE N.

Compiled from "General Annual Returns," 1874, Tables 18, 21, 23.

	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.
Ratio per 1,000 recruits who, absconded before attestation	27	23	19	25	33	20	23	14	16	14	16	19
Paid smart money...	71	60	64	81	90	79	82	66	69	68	82	86
Deserted after attestation	24	10	8	11	13	11	12	8	6	8	11	13
Ratio of soldiers per 1,000 average strength ¹ who—												
Deserted	20·5	13	13·5	14·3	16·8	17·7	17·2	15·1	17·8	17·5	23·6	30·5
Purchased their discharge	10	7·2	8·2	7·7	10·8	11·8	13·3	10·3	9·8	8·2	10·9	14·7
Committed suicide ² ..	—	·27	·33	·32	·26	·37	·41	·46	·56	·37	·40	

¹ Officers included to admit of comparison with previous returns.

² "Journal of the Statistical Society," June, 1874, p. 188.

O.—COMPARATIVE TABLE OF DESERTION PER 1,000 AVERAGE STRENGTH AT DIFFERENT TIMES IN THE PRESENT CENTURY.

Year.	Ratio of Desertion. ¹	Year.	Ratio of Desertion. ²	Year.	Ratio of Desertion. ³
1805 ⁴ ..	50·7	1831 ⁷ ..	5·2	1865 ⁸ ..	16·8
1806....	36·1	1832	4·1	1866	17·7
1807 ⁵ ..	23·7	1833	7·7	1867	17·2
1808....	34·9	1834	7·5	1868	15·1
1809 ⁶ ..	24·8	1835	7·3	1869	17·8
1810....	23·7	1836	5·8	1870	17·5
1811....	25·9	1837	9·5	1871 ⁹ ..	23·6
1812....	29·8	1838	10·2	1872	30·5

¹ Clode ii, 436; Marshall's "Military Miscellany," p. 105.

² Marshall's "Military Miscellany," pp. 313, 315, 316, 350 and 351.

³ "General Annual Returns," Tables 7 and 21.

⁴ Short Service, Pitt's Act.

⁵ Long Service, Wyndham's Act.

⁶ Life Service, Castlereagh's Act.

⁷ Life Service.

⁸ Long Service.

⁹ Short Service.

GRAPHIC REPRESENTATION OF THE RATE OF SUICIDE, DESERTION, AND
PURCHASE OF DISCHARGE, FROM 1861 TO 1872.

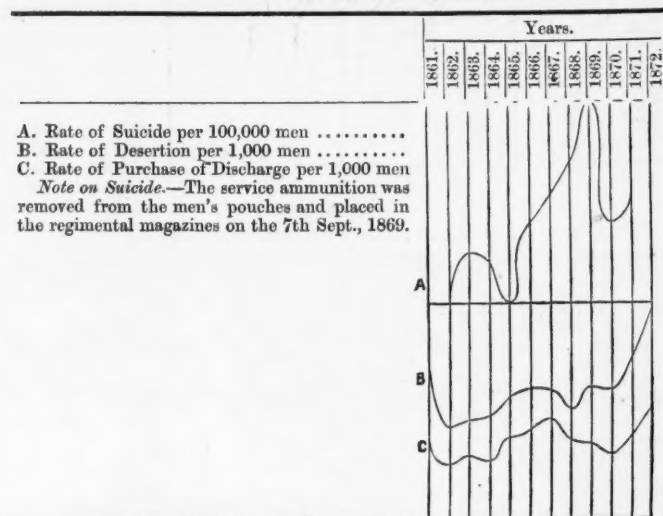


TABLE P.—SHOWING THE NUMBER OF FOREIGN MERCENARIES IN THE
ENGLISH ARMY, 1804–13.

Clode's "Military Forces of the Crown," ii. 436.

	Year.				
	1804.	1805.	1806.	1807.	1808.
English troops	133,554	139,581	159,076	163,641	189,210
Foreigners	17,039	22,375	26,043	35,816	37,217

	Year.				
	1809.	1810.	1811.	1812.	1813.
English troops	197,230	199,062	194,051	198,004	207,068
Foreigners	36,947	38,390	40,543	45,881	53,722

AND

1871.
1872.

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TABLE Q.—SHOWING THE PAY AND ALLOWANCES OF THE SOLDIERS

Clode's "Military Forces of the

(As to the Pay of Soldiers and Labourers)

Pay, &c.	Soldier.			England.						
	Private.	Corporal.	Sergeant.	Dorsetshire.	Flintshire and Denbighshire.	Yorkshire, near Doncaster.	Northumberland.	Surrey.	Hertford.	A.
1. Yearly pay in cash.	£ s. 22 16	£ s. 28 18	£ s. 41 1	£ s. 23 8	£ s. 36 8	£ s. 39 0	£ s. 41 12	£ s. 33 16	£ s. 26 0	£ 41
2. Fuel and light.	2 0	2 0	2 0	3 0	—	—	—	—	—	—
3. Lodging.	2 0	2 0	2 0	—	—	—	—	3 10	—	—
4. Garden, &c.	—	—	—	3 0	—	—	4 0	—	—	—
5. Carriage of fuel.	—	—	—	(⁶)	—	—	1 0	—	—	—
6. Harvest allowance.	—	—	—	1 15	2 10	1 15	—	1 15	1 10	—
7. Clothing.	2 0	2 0	2 0	—	—	—	—	—	—	—
8. Rations, &c.	3 8	3 8	3 8	—	—	—	—	—	6 10 ²	—
9. Medical attendance and sick pay	1 0	1 0	1 0	—	—	—	—	—	—	—
10. Good conduct pay.	1 0	1 0	1 0	—	—	—	—	—	—	—
11. Pension.	4 15	4 15	4 15	—	—	—	—	—	—	—
Annual:—										
Including pension.	38 19	45 1	57 4	—	—	—	—	—	—	—
Not including pension.	34 4	40 6	52 9	31 3	38 18	40 15	46 12	39 1	34 0	41
Weekly:—										
Including pension.	s. d. 14 11 ¹ / ₂	s. d. 17 4	s. d. 22 0	s. d. —	s. d. —	s. d. —	s. d. —	s. d. —	s. d. —	s. d. —
Not including pension.	13 1 ¹ / ₂	15 6	20 2	12 0	15 0	15 8	18 0	15 0	13 0	16

¹ This sum includes the extra wages and allowances which are given at hop-picking and harvesting, and is the wages² Daily allowance of cider.³ The labourer in Perthshire engaged by the day or week gets apparently more than when engaged by the year, but⁴ Daily allowance of oatmeal, milk, and potatoes.⁵ Is included in the £3 for fuel and light.

ES OF THE SOLDIER AND AGRICULTURAL AND TOWN LABOURER.

ry Forces of the Crown," i. 489.

s and Labourers, see 21 HD (3), p. 1,003.)

Agricultural Labourer.										Town Labourer.			
		Scotland.				Ireland.	Mr. Purday's averages.						
Hertford.	Kent.	Perthshire.		Fifeshire.		Average.	England.	Scotland.	Ireland.	London.	Manchester and Birmingham.	Edinburgh.	Glasgow and Liverpool.
		Farm Servants by the Year.	Servants by the Week.	Married.	Single.								
£ s. 26 0	£ s. 41 12 ¹	£ s. 22 0	£ s. 39 0	£ s. 17 10	£ s. 19 10	£ s. 18 9	£ s. —	£ s. —	£ s. —	£ 49	—	£ s. 39 3	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	3 0	—	2 15	2 12	—	—	—	—	—	—	—	—
1 10	—	0 15	—	0 18	0 18	—	—	—	—	—	—	—	—
6 10 ²	—	10 15 ⁴	—	16 10 ⁴	12 2	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—
34 0	41 12	36 10	39 0 ³	37 13	35 2	18 9	30 0	33 14	18 9	49	—	39 3	—
s. d. 13 0	s. d. 16 0	s. d. 14 0	s. d. 15 0	s. d. 14 6	s. d. 13 6	s. d. 7 1½	s. d. 11 6½	s. d. 12 11½	s. d. 7 1½	s. d. 19 0	—	s. d. 15 1	—

and is the wages of first-class labourers only.

ed by the year, but this is more than counterbalanced by the number of days in the year that he is usually out of work.

TABLE R.—SCHEME FOR A CONSCRIPT HOME ARMY.

	Year.									
	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	
<i>First Line, under Arms—</i>										
Regulares	100,000	90,000	80,000	50,000	—	—	—	—	—	
Conscripts of 20 years	—	10,000	20,000	50,000	100,000	100,000	100,000	100,000	100,000	
Total	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	
<i>First Reserve—</i>										
Conscripts of 21 years	—	—	10,000	20,000	50,000	100,000	100,000	100,000	100,000	
Conscripts of 22 years	—	—	—	10,000	20,000	50,000	100,000	100,000	100,000	
Militia and Yeomanry	130,000	130,000	130,000	130,000	130,000	50,000	—	—	—	
Total	130,000	130,000	140,000	160,000	200,000	200,000	200,000	200,000	200,000	
<i>Second Reserve—</i>										
Conscripts of 23 years	—	—	—	—	10,000	20,000	50,000	100,000	100,000	
Conscripts of 24 years	—	—	—	—	—	10,000	20,000	50,000	100,000	
Total	—	—	—	—	10,000	30,000	70,000	150,000	200,000	

N.B.—With the exception of the one year's service in the First Line, this Table is merely suggestive.

LECTURE.

Wednesday, April 7, 1875.

GENERAL SIR WILLIAM J. CODRINGTON, G.C.B., Vice-President,
in the Chair.

ON THE BEST PRACTICABLE METHOD OF ENSURING
EFFICIENCY IN THE ARMY, AND FOR OBTAINING AN
EFFECTIVE AND RELIABLE RESERVE, HAVING RE-
GARD TO THE EXISTING FEELING IN THE COUNTRY
ON THE SUBJECT.

By Major-General Sir EDWARD C. WARDE, K.C.B., R.A.

"All nations are in confident expectation of war, and all are alike arming and preparing to meet and defend themselves against its evils. It behoves England, like other nations, to prepare and provide for her military security."—"Considerations on National Defence." Addressed to the people of England, by General Sir Robert Gardiner, G.C.B. Third edition, 1860.

THERE are three points connected with the subject of my lecture which present themselves specially for consideration:—

First. Is the nation satisfied with the Army which it at present possesses?

Second. Assuming from all that has passed in Parliament, here and elsewhere, that it is not, what would be the best practicable mode of obtaining such an army as would satisfy the nation?

Third. Short service enlistment and general conscription having been proposed as the best means of obtaining such an army, is that method practicable? Will the country accept it, and is the Government prepared to propose that it should do so?

Assuming, for the sake of argument only, that this may be the case, would that method obtain an army such as the nation has, until within the last few years, hitherto possessed?—an army described by the Duke of Wellington as one with which he could go anywhere and do anything—or which nearly half a century later won the battles of the Alma and of Inkermann, and stamped out the Indian Mutiny?

If not, what alternative system which the nation will accept, and the Government would not hesitate to adopt, is the best calculated to produce the desired result?

It is in the hope that some progress may be made in the solution of this difficulty by so doing, that I propose to read the paper before me, which was written in August, 1874, and may probably be recognized by some now present, who read it in the autumn or early winter of last year.

I mention this fact, in order that I may not lie under the possible imputation of presenting to you a *réchauffé* of those views and opinions which have been discussed in Parliament this year, given utterance to in post-prandial speeches at Mansion House and other banquets, and so many of which have been set forth in leading articles and letters in the public press during the last six months.

One of the chief reasons, however, for my purposing to read this paper arose from the fact of so many of such views and opinions coinciding almost identically with those which are therein set forth.

I do not for one moment intend to assert with regard to them—what the talented author of that very able production, the Prize Essay on recruiting, does of his views and opinions therein expressed—that they are the only possible ones by which the difficulty can be overcome. I make them known, in order that other minds may either accept or reject, or possibly amend and improve them. I desire also to take this opportunity of expressing my acknowledgments to the Council for their kind courtesy in placing a day at my disposal for this purpose.

“The best practicable method for ensuring the efficiency in the Army, and for obtaining an effective and reliable Reserve, having regard to the existing feeling in the country on the subject.”

“To discard an old servant like an old cloak, is not economy, but the “worst species of extravagance; it is the surest method known to “obtain bad servants, to engender bad feelings, and to earn a bad “reputation.”

Before entering on a consideration of this subject, it is necessary to observe that England stands alone throughout the world in her relations with regard to it, and that a system which might be admirably well adapted to the great military nations of the continent, and be found successful in its operations, would be altogether alien to her views, and unsuited to her requirements.

Duties of Army during Peace.

It must be borne in mind, that England, instead of having her army concentrated at home, as the great military nations of Europe have, is obliged to provide for the maintenance of a sufficient force in her Indian Empire, as well as to consider the protection of her widely-scattered colonial possessions, to all of which (although recent policy has for the time almost denuded them of her military forces), she must be prepared to send efficient Imperial assistance, both by sea and land, in the event of such aid being required.

Cost of Transport.

This necessity must always greatly affect the cost of maintaining our Army, and the large drafts which we are compelled to send out

annually to keep our regiments in India effective, and the heavy expense which is thus incurred under the old system of long service enlistment, would show to how great an extent that expenditure must be increased if the short term of enlistment is continued, and becomes the rule of the Service.

Again, it is an undisputed fact that men going to a climate totally different to their own, take some considerable time to become acclimatized, that time, up to a certain age, varying as a rule in an inverse ratio to their age at starting.

According to our old peculiar system, the average age of men in a regiment going abroad would be that at which they would be least liable to suffer from the effects of climate. Under the Continental system, which we have for the present adopted, that average is likely to be reduced to that at which men are least able to combat, a trying climate. In fact, at present, no sooner is a man's physique fully developed, than he is drafted from the ranks, and his place supplied by a growing lad, whose strength will be first exposed to an Indian sun at the very time of his life when he can least resist it.

It is perfectly well known, and may be regarded as a recorded fact, that of the recruits sent to the Crimea, and to India during the mutiny, a very large proportion never did any duty in the ranks at all, but sickened soon after their arrival, went to hospital, and either died there, or were sent home as utterly useless, and at an enormous loss to the country. Had these recruits been a little older, and their physique more fully developed, the country would have got some return for its money in the good work they would have done, instead of its having to expend more in sending others out to do what those had failed in doing.

Description of Service.

The same code of military laws and terms of enlistment in the Army could scarcely be successfully co-existent in two nations where compulsory service and voluntary engagement are the terms on which men serve the State as soldiers in their respective armies.

The Army of England being necessarily on a very small scale numerically as compared with that of any of the great Continental Powers, is another reason why the same terms of enlistment in its ranks would not be applicable, with any chance or prospect of success.

It will be necessary to adopt some system which will not only ensure the possession of an army as good as any other military nation, but one that, from superior training and other causes, must be infinitely better, otherwise with what hope or prospect of success could the Army of England ever engage in hostilities at all?

It may possibly be imagined that this is taking a view of the subject that is never likely to be realized; but we have only to look back upon the past, and those glorious achievements of our Army which it records, to feel assured that there is no reason to doubt that what has been done in days gone by may be repeated in those that are to come.

Taking these circumstances into account, and bearing also in mind that anything like conscription or compulsory service is altogether

alien to the views of England at this period, it is proposed, in dealing with this subject, to assume that service with the Army will be altogether voluntary in the future, as it has been in the past.

Modes of Enlistment.—Enlistment for General Service.

One great obstacle to obtaining recruits of late years has been that change in the mode of recruiting which has done away with regiments and corps enlisting entirely for themselves, and enlisting them without any reference to their own predilections for general service, and also the liability which, in accordance with present regulations, they incur, by being drafted from one corps into another against their will—a regulation which not only throws a very serious obstacle in the way of obtaining recruits, but is prolific of desertion to a very great extent.

Men who might be willing to enlist, if they were allowed to choose the regiments in which they would have to serve, will frequently decline to do so under any other circumstances.

In confirmation of this assertion I beg to read an extract from a letter which I received last week from Colonel Kent, commanding the 77th Regiment, which I think will be admitted to be as striking an illustration as could possibly be given of the loss which has accrued to the Service by this abolition of regimental recruiting, and which goes a long way also to prove that voluntary enlistment for the Army, if properly conducted and encouraged by higher inducements, which need not be ruinous to the country, would answer all our requirements.

"You are most welcome to make use of what I told you about our 'linked militia regiment,' the Royal London, and I sincerely trust that it may do some good, because nothing can be worse than our present system of preventing men enlisting for particular regiments if they like.

"The Officer commanding the East London told me himself, at the completion of their last year's training, that he would give me 100 men if I could take them for the 77th, but that they would not enlist for the brigade; and I am sure that he did not exaggerate, because formerly I used to get a heap of men from that regiment and the Royal East Middlesex Militia—*such nice smart men*—that any Commanding Officer might be proud of, and now I get not one: comment upon this is needless."

And again, men who have enlisted and become attached to the corps in which they are serving, have in many well-recorded instances resented a compulsory removal from such corps, by deserting at the first opportunity after their removal.

Enlistment for particular Regiments.

It is essentially necessary, when framing laws for the future enlistment of men into the Army, to guard against any clause that might tend to induce them to desert after enlistment, and it is therefore suggested that the localisation scheme recently introduced should for the future be rigidly adhered to, with the exception of that clause which enlists men for the brigade instead of for each regiment.

By this scheme, regiments would, as of old, enlist entirely for them-

selves, which would ensure to men enlisting, a knowledge of the regiments for which they were offering themselves, and would further carry out the advantages which the localisation scheme was intended to introduce, viz., an interest throughout all ranks and classes in each sub-district in the regiments belonging to it, an intimate association, and, so far as is practicable, a personal knowledge of each other, between the regiments, the militia, and the volunteer corps, that are by these regulations to be permanently associated with them; and to rouse such a feeling of attachment to each regiment throughout its own district as to ensure a continuous flow of recruits into its ranks in any numbers that might be required; it being also distinctly understood that men could not be drafted from the corps in which they had engaged to serve against their will, except under the most urgent necessities of the Service. This state of things could scarcely ever exist; as experience has shown that, whenever volunteers are wanted to complete regiments ordered on active service, the supply has invariably been greater than the demand.

These regulations need not prevent recruiting parties being sent out of their own districts to different parts of the country when, as may sometimes occur, they are unable to raise the large number of recruits that are often required at short notice to bring up a regiment to its increased strength for ordinary colonial service.

There may be no reason why recruiting parties enlisting for general service should not take an interest in their duty: still it is more than possible that, not knowing what may become of the men they enlist, and getting no extra credit for unusual exertions, they will not take that pride in their work, which would be only natural if they knew that the result would bring credit to themselves from their own regimental head-quarters; whereas it stands to reason that, where regiments enlist their own men, they will naturally, and in accordance with the rules of human nature, take a special interest in getting the best men that they can find, and every officer, non-commissioned officer, and man, engaged in such duty, will take a pride in obtaining them.

One great advantage of these regulations would be the saving of the considerable expenditure now required for the maintenance of the existing head-quarter recruiting staff and its various branches throughout the country.

Conditions of Service.

It is proposed to state, as succinctly as a clear apprehension of the subject will allow, the relative advantages and disadvantages of the different modes of enlistment under which men are now invited to the Standard, and which may be classed under the heads of Long and Short Service.

Short Service.

The advantages which it is proposed to obtain by the introduction of short service are:—first, to establish an Army Reserve, as the result of the number of men that would, under this system of en-

listment, be drafted annually into it from the ranks of the regular Army.

It is extremely doubtful—to many, more than doubtful—whether the inducements at present held out by this system would have the desired effect of obtaining for the country a *reliable* army of reserve, of such strength as to be of any real value; because the small allowance of four pence a day, which would cease the moment a man completes his service in the Reserve, is no sufficient inducement to keep him in the country, coupled as it is with the great disadvantage of rendering him liable, at any time, to be called away from his civil employment in order to revert to his duty with the colours, and thus, for an uncertain period, have his connection severed with whatever branch of trade he might have established himself in, without being able to look forward to any ultimate substantial compensation for such a loss.

On the other hand, this allowance, paid as it is in lump sums, is a bonus to tempt men out of the Army, for, in other words, it says, if you are sick of the Army, go into the Reserve, where you will soon be given enough money to assist you in emigrating, and in thus placing yourself beyond the reach of your obligations!

In this way how *could* the Reserve ever become a reliable force?

Again, after the first six years of a soldier's life, he has got over the drudgery of his recruit drills, but *not* served long enough to appreciate his soldier's life; he is for the present time sick of soldiering, and willingly takes advantage of the Reserve to get quit of it, and goes back to his home full of grumbling and discontent; whereas if not allowed to join the Reserve for a longer period, the drudgery of his recruit days has become effaced by the after-comforts and advantages of his soldier's life, which he has since learnt to value, and he eventually joins the Reserve with very different feelings.

Many men enlist because they are too unsteady for civil life; those good for anything become steadied during their few years' service, have had time to look about them, find good openings in civil life, and are tempted away directly their time is up; and only those who are good for nothing remain, the country being unable to dispense with their services.

Another supposed advantage of short service is, that such mode of enlistment would be more attractive, and would be the means of inducing a better class of men to join the Service; but, in so far as it has as yet been tried, it has utterly failed in producing the expected and hoped for result.

Among the disadvantages of short service would be the extreme difficulty of obtaining reliable and trustworthy non-commissioned officers; because, as already shown, many of the best men, after their careful training would, at the end of their short service, gladly accept good openings in civil employment; whereas if they had not this opportunity, they would settle down to their soldier's life, and eventually become good non-commissioned officers, without which it would be impossible either to form or to maintain a real Army.

Again, it takes some time before officers can learn the characters of

their men, and some time before men can learn to have confidence in their officers.

In the large armies of the Continent some of the above considerations may not be of so much importance; but in our own, which must always be much smaller, it becomes necessary to develop its every quality to its fullest extent. Experience, perfect training, mutual reliance, will render a little army far superior to a numerically large one without these qualities; but the possibility of being able to develop them under the Short Service System is open to grave doubt; and it behoves, therefore, those who are charged with legislative powers, to ponder well before depriving our Army of those qualities which constitute the mainspring of its strength; which, and which alone, have enabled it to meet and to overcome almost any amount of odds that have from time to time been arrayed against it: take, for example, the result of that glorious struggle which took place on the heights of Inkermann.

“Esprit de Corps.”

By the introduction of short service into the Army, we should deprive it at once, and for ever, of one of the chief elements of its past successes, viz.:—“*Esprit de Corps*,” and of those ties, invaluable ties, which have hitherto bound officers and men together in bonds of sympathy, of mutual affection and regard, and which have given them such implicit confidence in themselves and in each other, as have resulted in those glorious victories and bright achievements which have made England respected, and her Army celebrated throughout the world.

This in itself should make those who are entrusted with the destinies of England pause and consider this subject long and anxiously before introducing, or it must now be said before perpetuating a system, which there can be no hesitation in saying would, for the above-mentioned reason, be condemned by nine-tenths of all ranks of those in the British Army who have known what the true value of those feelings is, by having tested it whilst on active service in the field.

Long Service.

The chief advantage to be retained by a system of long service-enlistment has been shown in the preceding paragraphs, and need not therefore be repeated; but, in addition, it is believed that under certain conditions that will hereafter be detailed, it would secure a better class of recruits; the old prestige and high character which, by its deeds, the British Army has won for itself throughout the world, would be preserved, and it would not become necessary to sacrifice the Army, in the hope by so doing of obtaining what would at best prove to be a doubtful and unreliable Reserve.

Attraction to the Ranks.

Where either conscription or generally compulsory service is the national law, there can never be any difficulty in obtaining any number of men for service in the Army that may be required, and the various

classes of society will be called upon to furnish their relative quota to any extent that may be considered necessary. But where, on the other hand, engagements to serve with the colours are, as in this country, purely voluntary, a system which has hitherto been one of our proudest traditions, and the envy and admiration of the world, such temptations must be held out as will induce men to enter the Service; and unless the terms which are offered are of such a character as will be in some degree superior to those which the class of men who enlist generally in our Army can obtain for themselves in the various occupations of civil life, one of two results must necessarily follow: either the requisite number of men will not be forthcoming, and the required complement will not be maintained, or it will be composed of the refuse of the people, both physically and morally, who will be unable to obtain any other employment.

It becomes necessary, then, to consider what those terms should be which will attract men in sufficient numbers to the standard; and of such a class as will be calculated to prove a credit to the Service, and to maintain, whenever a time of trial comes, its character and prestige—a result which it is hoped that the proposals made in the subsequent pages of this paper may be found capable of obtaining.

It will probably be desirable, in enumerating the terms above referred to, that they should be classed under seven different heads, as under:—

- 1st. The Rate of Pay to be received whilst serving.
- 2nd. Duration of engagement.
- 3rd. Prospects of advancement in the Service.
- 4th. Indulgences to be accorded to well-behaved men.
- 5th. Gratuities to be granted to widows and orphans.
- 6th. Pensions to be received on completion of engagement.
- 7th. Prospects of after employment as pensioners.

1st. *The Rate of Pay to be received whilst serving.*—In treating of this portion of the subject it is not considered necessary to make any suggestions with regard to the daily rate of pay at present received by the rank and file, as it is believed that the advantages which are held out to them, and which will be hereinafter enumerated, coupled with the increased pay and pensions which it is considered that the higher class of non-commissioned officers should receive, would hold out sufficient inducements to them to ensure an ample supply of recruits of such a class as it is desirable to obtain.

Pay of Non-Commissioned Officers.

The case, however, is very different as regards the two senior ranks of non-commissioned officers, the staff sergeants and sergeants of the Army, and when it is known that the lowest class of warrant officers¹ in the Royal Navy, of which there are three, has a higher rate of pay than the best paid staff sergeant in the Army; that the first class warrant officer has £51 11s. 3d. more than any staff sergeant of in-

¹ The pay of a first class warrant officer is £120 a-year

"	second	"	"	£100	"
"	third	"	"	£90	"

fantry; and, as is shown in the annexed tabular statement, that the rate of wages that can be earned by different classes of unskilled labourers throughout the country, is, after all necessary deductions, in some cases as good as and even better than that of staff sergeants, it surely must be conceded that an increase in the pay of these two grades of non-commissioned officers in the Army is required.

Rank.	Daily pay.	Stoppages.				Residue.
		Food and fuel.	Clothing.	Lodging.	Total.	
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Sergeant-major	*3 3	0 6	0 9	—	1 3	2 0
Staff-sergeant	*2 5	0 6	0 5	—	0 11	1 6
Sergeant	*1 11	0 6	0 5	—	0 11	1 0
Dock labourer.....	5 0	2 0	0 6	1 0	3 6	1 6

Wages have risen since 1870 at the rate of 48 per cent. in Northumberland; Durham, 50 per cent.; at Verviers, 20 per cent; Ghent, 60 per cent.; in Silesia, 60 per cent. Labourers in America earn from 24s. to 36s. a week. Cost of living, 14s. a week.

Colliers' Wages.

	<i>s.</i>	<i>d.</i>	
"Hewers"	48	9	per week.
"Timbermen"	53	5	"
"Landers"	36	9	"
"Haulers"	31	6	"
"Labourers"	24	0	"

It is scarcely possible to estimate too highly the value of these two classes of non-commissioned officers. They are the connecting links between the officers and men, and it would be impossible to maintain a high state of efficiency and discipline without having in these positions men of high moral character, and rather more than average ability.

If therefore the object sought, of first obtaining such men, and, secondly, of inducing them to remain in the Service when secured, is to be attained, it seems only reasonable that higher inducements should be held out to them; and it is believed that a higher rate of pay whilst serving, combined with the advantages of warrant rank, and a correspondingly increased rate of pension on discharge, would tend very materially to produce the desired result.

It is further suggested that the existing regulations, by which a corporal when promoted to the rank of sergeant loses any good conduct pay that he may be receiving at the time of his promotion, should be considered and amended; because, as these regulations now stand, they tell unequally upon men so promoted; and the men whose

* These rates are Infantry pay.

steadiness and general good conduct have rendered them entitled to this additional amount of pay, lose the advantage which such good conduct has obtained for them.

In illustration of the above, it may be stated that a corporal promoted to the rank of sergeant, and being at the time of his promotion in possession of four good-conduct badges, would benefit by four-pence a day, whereas a corporal promoted, in possession of one good-conduct badge, would benefit by seven-pence a day.

It is suggested, therefore, that the recipient of good-conduct pay should continue to receive throughout his service, or until he might obtain warrant rank as a regimental staff sergeant, the amount of any good-conduct pay of which he was in receipt at the time of his promotion to the rank of sergeant—as this would tend to increase his daily pay, and hold out an additional inducement to young soldiers to conduct themselves steadily and well.

2nd. Duration of Engagement.—It is proposed that men should, in accordance with the views set forth in this paper, enlist for nine years with the colours and three in the Reserve, with the option of prolonging their engagements either with the colours or in the Reserve, on terms which will be stated in detail when the latter portion of the subject—the formation of the Reserve—is dealt with.

Grant of Commissions.

3rd. Prospects of Advancement in the Service.—It is more than doubtful whether the granting of commissions to non-commissioned officers can be considered advantageous, and it is fully believed that in the great majority of cases it is rather ruinous than otherwise.

This is more certainly the case now than when purchase existed in the Army, and a man could look forward to the hope of selling his commission, and thus realizing a sum of money for himself, if a bachelor, or for his wife or family, if married.

Under existing circumstances, a man who has perhaps led a happy and contented life, and whose pay has been sufficient to keep both himself and his family in a state of comfortable independence, and who has friends around him with whom he associates in free and social intercourse, finds himself suddenly raised to a rank above that in the social scale to which either he or his family have ever been accustomed, and in accordance with the necessary rules of the Service, cut off from his former friends and companions, and called upon to maintain, not only in his own person, but as regards the outward appearance of his family as well, the position of “an officer and a gentleman.”

To enable him to fulfil this latter condition, what means are placed at his disposal? He receives, as a lieutenant, a trifle more in amount of daily pay than is earned by a dock labourer of industrious habits in London, or any of our great commercial ports!

Can it then be considered as either an act of kindness, or a just or adequate reward for high intelligence, or long, faithful, or distinguished service, to place a man in such a position?

It is not proposed, in making the above observations, to close the

door entirely to this species of reward, or to abolish altogether such an object of ambition to the soldier as the elevation to commissioned rank; because there are doubtless cases in which men who have enlisted in the ranks and distinguished themselves, either before an enemy in the field or by long and meritorious service, may have private means independent of their military pay, or may have friends who might be both able and willing to assist them, or who might from peculiar circumstances be better fitted for such a total change in the social scale than the generality of the class to which they belong. To such men it is most desirable that such an honourable object of ambition should be held out. But these men will always be exceptions to a general rule; and it is equally desirable therefore to adopt some other mode of advancing and rewarding deserving non-commissioned officers, that shall not be open to the objections above enumerated; and with this object in view it is suggested that the advantages of warrant rank should be restored to the Royal Artillery, that it should be extended in that arm of the Service, and introduced into the rest of the Army. It is believed that it would be considered a great boon to the Service at large, and that it would hold out a very strong inducement to good men to enter it, and to good and trustworthy non-commissioned officers to remain in it, if warrant rank, of which they were some years since deprived, was restored to the master gunners of Royal Artillery; if it was extended to the brigade staff-sergeants of that arm of the Service, and accorded to the regimental staff-sergeants of the rest of the Army. It may appear at first sight that this is rather a wholesale recommendation of advancement for the non-commissioned officers of our Army; but when it is considered that an army without really good and reliable non-commissioned officers can never be good for much, or in any way to be depended on, and when we know, as from unhappy experience we now do, that, with a very few and rare exceptions, all non-commissioned officers quit the Service the moment they have it in their power to do so, and almost invariably find immediate and lucrative employment in civil situations, it becomes necessary—absolutely and essentially necessary—to hold out to them such prospect of advancement and remuneration as will induce them to feel that it will be more to their own advantage to remain and serve their full time for pension in the ranks, than to leave at the expiration of their first term of engagement, and seek for employment in civil situations.

Punishment of Non-Commissioned Officers.

It may be well to advert under this head to the laws which regulate the punishment of non-commissioned officers, and to offer a suggestion for their modification, because, although it is not within the scope of a paper on this subject to enter into any detailed provision for their alteration, it is considered competent to the writer of it to offer suggestions, which will of course be left for the consideration of those within whose province it lies to give orders and to issue from time to time amended laws and regulations.

As the law at present stands, there are certain offences for which non-commissioned officers must of necessity be brought to trial by

court-martial, and for all offences, if convicted, they must also, of necessity, be sentenced to reduction to the ranks. This may, and frequently does operate with great hardship upon excellent, good, men, who for one fault accidentally committed towards the close of a period of service which may up to that time have been characterised by systematic and unvarying good conduct, are suddenly disgraced and ruined, without any hope or prospect of recovery.

It would seem therefore desirable to accord to commanding officers increased discretionary power in bringing men to trial by court-martial, and so to amend the laws which now exist with regard to crimes and punishments, as will enable courts-martial to award some minor punishments which would not utterly ruin a man whose period of service might be drawing to a close, or as would enable a non-commissioned officer of shorter service to recover the position he had lost.

There can be no doubt whatever that strict and even stringent laws are necessary for the maintenance of discipline in an Army, but there can be as little doubt that human nature is subject to infirmity, and that those whose duty it is to frame such laws as are above referred to, would do well to bear this in mind; and it is firmly believed that a due consideration for these unavoidable weaknesses of humanity, in drawing up such regulations, would not only tend to strengthen and improve discipline in the ranks, rather than to impair or weaken it, but would also assist materially the object for which this paper is written, by inducing good and respectable men to enter them.

4th. Indulgences to be accorded to well-behaved Men.—This is a point that may very fairly be considered open to some relaxation as regards existing regulations.

But as it must, in a great measure at all events, be left in the hands of commanding officers, it may suffice to say, that as much indulgence should be granted to good men as is consistent with strict discipline.

This point is considered an essential one, when the subject under consideration is, as in the present instance, how best to attract men and induce them to devote their lives to the military service of their country; a long experience having proved that it is far easier to lead men than to drive them, and that the commanding officer who proves to those under him that he identifies himself with them, and takes a real interest in all those minutiae of detail which affect their comfort and their happiness, will get ten times as much work—and willing work too—out of them, as the one who stands aloof from them, and regards them as mere machines, simply to do the work required of them.

5th. Gratuities to be granted to Widows and Orphans.—Granting gratuities to widows or orphans of soldiers who might die while serving, would be an additional encouragement to men to continue in the Service.

This plan has been found to produce most beneficial results in our Metropolitan Police Force, and might be extended, on a modified scale, to our Military Service, without involving any serious augmentation to the Estimates, if calculated in the following manner:—Confine the

boon to men who, at the time of their death, might be in receipt of good-conduct pay, and then hand over to the widows or orphans the difference, for two years, between the pay of the deceased and the recruit that takes his place. At present a man's death is, in one sense, a gain to the country, inasmuch as the recruit who takes his place gets less pay than *he* would have received had he continued to live; whereas, by handing this difference over to the widows or orphans, the country does *not* gain what, on the whole, would be but a paltry sum in the Estimates, but which *would* be a valuable boon to the objects of the charity. The married soldier would thus feel that his continued good conduct would prove advantageous to his family, even after his death; a great cause of restlessness would be removed; he would be more inclined to continue in the ranks, instead of being constantly on the look out for some civil employment that might enable him to make the above provisions; and further, it would be an additional inducement to men to behave well, knowing, as they would do, that the loss of a good-conduct badge would entail, not only a temporary loss of a penny a-day, but an eventual loss to their families.

The gratuities that would be awarded, according to the above-mentioned proposal, would vary in sums of from £3 to £15.

The following scale gives the amount of these gratuities:—

The widow or orphans of a man in—

			£	s.	d.
1st period of service and	1	G.C.B.	3	0	10
"	2	"	6	1	8
2nd	1	"	6	1	8
"	2	"	9	2	6
"	3	"	12	3	4
"	4	"	15	4	2

6th. *Pensions to be received on completion of Engagement.*—This subject will also be dealt with under the head of "Formation of Reserve."

7th. *Prospects of after Employment as Pensioners.*—All pensioners should be registered for employment in the Public Departments, and should have a preference for employment over civil competitors in such positions as they may have been registered as competent to undertake.

FORMATION OF RESERVE.

The difficulty which presents itself with reference to this portion of the subject, is the mode by which a Reserve can be obtained in connection with long service, that shall be of sufficient numerical strength to justify its adoption; but it is believed that this difficulty can be overcome in the following manner, viz.:—

Length of Service.

That men shall be enlisted for nine years with the colours, and three in the militia, with the option of continuing to serve in the militia for six years, at the expiration of which time they should become

entitled to a pension of sixpence a-day, in addition to any good conduct-pay to which they might have become entitled during their nine years' service with the colours, and with the further option of continuing to serve for twelve years with the militia; at the expiration of which time they should become entitled to a pension of one shilling a-day, in addition, as above, to any good-conduct pay to which they might have become entitled during their service with the colours.

Any soldier who should re-engage to continue serving with the colours, should, at the expiration of fifteen years' service, and three in the militia, become entitled to a pension of a shilling a-day, in addition as above to good-conduct pay; and, should he still continue to serve, become entitled, at the expiration of twenty-one years' service, and three in the militia, to a pension of one shilling and sixpence a-day, and good-conduct pay.

The above is shown below in a tabular form.

Scale of Pensions.

	s.	d.
Pensions after 9 years with colours, and 6 in the militia	0	6
" 9 " 12 "	1	0
" 15 years with the colours, and three in the militia	1	0
" 21 years with the colours, and 3 in militia	1	6

The above pensions to be in addition to any good-conduct pay obtained during service with the colours.

The pensions of non-commissioned officers should be in proportion to their rates of pay on discharge.

Strength of Reserve.

Should the Reserve that would be thus formed, not be considered sufficient, the present strength of the militia might be increased by recruiting.

Cost of Reserve.

If the above increase to the militia be found too costly, it might be modified in the following manner:—The militia recruits to be called out, as at present, for forty-one days. The trained men and old soldiers to be divided into two classes. The second class to consist of soldiers who had not completed three, and men who had not completed five trainings, to be called out for twenty-seven days.

The first class to consist of militiamen of over five, and soldiers of over three trainings, and to join head-quarters only for the last fourteen days of the annual training.

Men who had served with the colours for fifteen and twenty-one years respectively to belong to the first class.

This arrangement need entail little or no extra staff, but merely increase the strength of existing battalions; but some of its great advantages would be, that such Reserve, whatever its numerical strength, would be substantial and reliable; the old soldiers would be

kept more efficient by being drilled with large battalions, instead as at present in small ones; the vast advantage that would accrue to the militia, and the great facility that would be given to its instruction during the annual periods of training, from having such an admixture of thoroughly trained and well-affected soldiers in its ranks; the fact of having throughout the country men returning to their native places in a happy and contented frame of mind on leaving the Army, instead of doing so in a discontented and disgusted state; and, above all, the priceless value of retaining an active army of thorough and real soldiers, imbued with the feelings that have already been described under the head of "Advantages of Long Service," instead of sacrificing such an army, and substituting for it an array of armed men, scarcely knowing their officers or being known by them, in order to obtain the very doubtful advantage of having a Reserve of greater numerical strength, which might or might not be forthcoming when required. And again, when it should be found necessary to call the old soldiers back to the colours, the militia would, under this system, merely revert to what it was before, only in a far more efficient state.¹

"The great crisis of the world is nearer than some may suppose, and we ought to be active in preparing to take our share in that crisis, which honour and self-preservation may demand."—*Disraeli*, 1874.

Concluding Remarks.

Having now enumerated the various points which it is considered would have the desired effect of attracting men to the standard, and inducing a sufficient number of the respectable portion of the labouring and artizan population to enter and to make a profession of the Service, and thereby to solve the existing problem of enlistment for the Army, as well as to obtain a sufficient and reliable Reserve, there remains but one point further to touch upon with reference to this subject, and that, the relative cost of the two systems, viz., that which is now in operation, and the one which is sketched for consideration in the pages of this paper.

There can be no doubt that the latter would be the more expensive of the two, but not to such an extent as should induce the Government of this great and wealthy nation to hesitate a moment in adopting it, provided it is considered the best calculated to obtain the desired result.

It has been said, and, doubtless, with truth, that "Economy is the life of the Army;" but the question naturally arises, what is economy? Is it economy to spend millions annually on the Army

¹ It will doubtless be objected to this mode of obtaining a Reserve, that it would take far too long a time to come into operation, but that difficulty may be very easily overcome.

Give every man now serving, all those who have become pensioners within the last two years, and all men of good character who have taken their discharges at the expiration of their first period of engagement, also within the last two years, the option of accepting its conditions. You would thus doubtless obtain a Reserve at once, of considerable force, which would increase annually, and the flow of men into which would be unceasing and continuous.

Estimates without getting the value of your money? that is, in this case, without getting what is wanted, a contented and effective Army, supplemented by a reliable and efficient Reserve. Would it not be far more like true and real economy to expend one or two millions more, and to succeed in realizing the object for which such sum is expended, by having an Army of such power, and so organized, as to secure the nation which it is paid to serve, against insult or contumely abroad, and to enable those out of whose pockets the money so expended comes, to rest in perfect and peaceful security at home.

"The Army is the annual premium of insurance against foreign invasion and the dismemberment of territory. You cannot diminish the premium without diminishing at the same time the safeguards of the country. Forgetfulness of this has cost us two of our most patriotic provinces and five milliards."—*Committee of Organisation of the French Army, 1874.*

Do not the number of insurance offices existing prove, beyond a shadow of doubt, the great extent to which private property is insured by those individuals by whom it is possessed? Are not the risks incurred by fire or by the perils of the deep guarded against most carefully in a very large majority of instances? What are these dangers, what these risks, compared to the utter destruction that would swoop down upon these very properties and possessions, in the event of a successful invasion of this hitherto peaceful and happy land?

It rests, then, with the Government to consider and decide whether they will look this question firmly and fully in the face, and tell the country whose affairs they have been chosen and appointed to administer, frankly and truthfully, that its defensive forces are not in a condition to answer the purpose for which they are maintained; and that if it wishes to uphold its honour and prestige amongst the great nations of the earth, it must adopt such measures as they are prepared to propose, and it must do in this case what daily experience proves must be done in every transaction of life—it must pay for them.

Nations, like individuals, must pay the market price for what they want. If a man wants a good weight-carrying hunter, he cannot expect to get one for the price he would pay for a weedy hack.

In support of that which is here written, mark the words of a Conservative War Minister, spoken in Parliament during the Session of 1859, when referring to the inefficient state of the Army at that time:—

"I will not allude to the measures which the Government, with the sanction of this House, may take to mitigate this evil, but I think it fair that the country should know what are its real resources, and should not rely upon what on paper may appear extremely formidable, but in reality may be weak."

Hear also the explanation of the Chancellor of the Exchequer of the same Government, in laying before the House of Commons the Budget for the year.

"You are now called upon to meet an expenditure, which, legitimate and necessary as it is, has reference strictly and exclusively to your

"own wants—to the wants of the time in which you yourselves are living. We have come into office with a full conviction that the great demands made upon the House, are demands both justified and required by the circumstances of the country.

"I refer it alike to the hearts and understandings of those who hear me, and of those out of doors who will consider our discussions and debates, whether we should not shrink from our duty, and disgrace the memory of those who have gone before us, if we were to hesitate to say that we would provide for the wants of the day in which we live, not in such a manner as will further embarrass our posterity, but out of the resources immediately at our command?

"I am not addressing you in unconsciousness of the increase made to the Army and Navy Estimates, which unforeseen circumstances have rendered of immediate necessity, but in considering the amount of estimates voted, I would say, *it is not the amount to be considered, but the national exigencies imperatively required for the country's safety.*"*

Mark well and carefully digest also the words of one of England's noblest sons, Arthur Wellesley, Duke of Wellington, in which he bears testimony to the horrors endured by nations afflicted by foreign invasion, and in which he recorded his prophetic warning against the dangers awaiting England from her disregard of home defence—and although much has been done since those days, so much still remains to do, that they are not inapplicable at the present moment.

"Look at the course pursued by France in Italy and Russia; at Vienna repeatedly, at Berlin, at Moscow,—the contributions levied, besides the subsistence, maintenance, clothing, and equipment of the army which made the conquest! Look at the conduct of the Allied Army which invaded France and had possession of Paris in 1815! Look at the amount of the pecuniary sacrifices made on that occasion, under their different heads of contributions, payments for subsistence and maintenance of the invading armies, including clothing and other equipments. * * * Then look at the conditions of the Treaties of Paris, 1814, 1815.

"France, having been in possession of nearly every capital in Europe, and having levied contributions in each, and having had in its possession, or under its influence, the whole of Italy, Germany, and Poland, is reduced to its territorial limits as they stood in 1792.

"Do we suppose that we should be allowed to keep, could we advance a pretence to keep, more than the islands composing the United Kingdom, ceding disgracefully the Channel Islands, on which an invader had never established himself since the period of the Norman Conquest?

"I hope that the Almighty may protect me from being the witness of the tragedy, which I cannot persuade my contemporaries to take measures to avert."

* These are noble words, such as are worthy of an English Minister, and specially worthy of him by whom they were spoken, our present Premier, Benjamin Disraeli.

If we in our day wish to be assured of the accuracy of that which is thus so forcibly described, we have only to turn our attention upon those terrible events which have taken place under similar circumstances within the last four years, during which time they have been repeated under conditions of fearful aggravation.

Should we not then be eager to profit by the lesson which has thus been recorded for our instruction in this blood-stained page of history—being thus forewarned, should we not unite as one man in the determination to be fore-armed, and should not the high aspiration, the earnest prayer of every true-hearted Englishman at this moment be, that we may be wise in time, that we may look to our bolts and bars, and take measures to render them so thoroughly secure as to ensure the maintenance of our supremacy abroad, and our perfect security at home?

That England may still be respected and free,
The envied of nations, the Queen of the Sea.

Friday, April 9, 1875.

GENERAL SIR WILLIAM J. CODRINGTON, G.C.B., &c., &c., Vice-President, in the Chair.

DISCUSSION on Sir E. WARDE's lecture, and on Recruiting, which formed the subject of the Essays written for the Gold Medal.

Captain HIME, R.A., F.S.S.: As the object of this meeting is discussion, I shall simply give a *précis* of my Essay, condensing my remarks as much as possible.

There are but four possible systems of recruiting. The first is the mercenary. In the present political state of Europe the mercenary system of recruiting is impossible. The second is the vicarious, or late French system. The history of the French Army, from 1792 to the present day, I think, points to one conclusion, and to one conclusion only, and that is, that the vicarious was a sham. The third possible system of recruiting is our voluntary system. There are various forms and modifications of the voluntary system, but after an expenditure of an unparalleled and enormous amount of money it only supplies us with men who physically and mentally are the very worst we could select from the materials at our command. The fourth, and last system is, the system of conscription. Let me explain that I do not propose conscription, I merely say conscription is inevitable, and will come upon us sooner or later. When it does come, I have no doubt, if it is properly carried out, it will give us the best Army we have ever had, at the very cheapest cost.

I wish, before sitting down, to make two observations. The first is, with reference to a very kindly critique which appears in to-day's *Standard*. My critic remarks, that the Army which I demand, is numerically of preposterously large dimensions. He says I have asked for a first line of 100,000 men. I have done so; but a glance at the Army Estimates for this year will show that we have at this present moment, or at least we had on the 1st of January this year, under arms in England 96,279 men. I trust, therefore, my hearers will agree with me that my demands are not very extravagant if I ask for 100,000. If any purist insists upon an army of 96,279, I shall be the first to receive it. I have merely taken 100,000 in my Essay as a matter of round numbers.

The second observation I wish to make is this, and I make it because it may save time by putting a stop to useless discussion. From some unfortunate carelessness in my language the *Pall Mall* has come to the conclusion that I am fond of conscription. I beg to say I have no *penchant* whatsoever in favour of conscription. At present my life and the life of every Officer in this place is comfortable and easy, if we compare ourselves with lawyers, and doctors, and other professions. Under any system of conscription whatever, from leading this comfortable and easy life, we shall become converted, so to speak, into drudges and drill-sergeants. Therefore I say my private interests, and the private interests of every Officer in the Army, are dead against conscription. But we are citizens as well as soldiers, and it is our duty to sink our private interests when we find they are in opposition to the public good. I look upon conscription as I do upon the amputation of a broken and withered limb. The operation may be, it must be, painful; but it is inevitable, and we must forget our private interests if the result be likely to prove a great public good. As discussion is the object which this meeting is intended to promote, I shall delay you no longer.

Major-General Sir LINTON SIMMONS: Sir William Codrington, Ladies, and Gentlemen,—I think that the Members of this Institution, and the country generally, are greatly indebted to the Council for having established a medal to promote study in the

Army, and to benefit the Service; and that they are particularly indebted to them for having selected this important subject for the essay of the present year. They did me the honour to ask me to be one of the umpires for awarding this medal, but I felt it my duty to decline, because I have written a good deal on the subject, and therefore, perhaps, could not have approached the consideration of the essays without prejudice; and certainly, able, interesting, and well-written as Captain Hime's essay is, I differ in some very important points from it. I cannot admit with him that he has exhausted the question of voluntary enlistment; on the contrary, I believe voluntary enlistment is the real means for getting out of the difficulty in which the country is placed. I believe that conscription, which is a Continental invention, is not at all adapted to this country. If conscription were put in force for a couple of years, the country would resist it, and would entirely give it up. I do not see my way to a selection, from the very large number of young men who arrive at maturity every year, of the quota that is annually required for the Army. People run away with the idea that every German is a soldier; this arises probably from a mistaken apprehension of the law. Every man who arrives at a certain age in Germany is liable to military service; but it does not follow, because he is liable, that he is taken; on the contrary, we know that the peace army of Germany is fixed at one per cent. of the population. The population being 40,000,000, the army is 400,000, and is composed of conscribed contingents for three years, being about 135,000 a-year. Now the number of young men who arrive at twenty years of age in Germany is somewhat under, but close upon 400,000; therefore it is evident that only about 35 per cent. are drafted into the ranks of the Army, and 65 per cent. escape. In a country, governed as Germany is, without a Parliament or press in which discussion is as free as it is in this country, the process of selection is comparatively easy; but I doubt very much whether it could be carried out in this country; and if it could, I believe it would be about the most unequal and iniquitous tax ever put upon the country, and that discipline in the Army would be impossible if it were formed in that way.

There is another point in the essay to which I will advert. Captain Hime is not quite consecutive in his ideas, when he proposes a volunteer army for India and the Colonies. Now the number of troops in India and the Colonies is about 84,000, and if to these be added a proportion at home about 16,000, serving upon the same terms, for the purpose of furnishing the necessary reliefs to these troops, they would make altogether a force of about 100,000 men, who, I think every Officer in this room will agree, must be raised by voluntary enlistment. The balance of 82,000, making up the whole of the Army, can alone be enlisted in some other way. Now, I believe that you could not have the two systems of enlistment, voluntary and compulsory, going on together, side by side, and therefore that the whole of the enlistment must be voluntary.

In dealing with this subject there is a matter in connection with it, which I think should precede the discussion of this question, viz., the absolute necessity that exists that something should be done without delay. I see that Captain Hime, in his Essay, says that it would be madness in this country to risk itself with an army of only 60,000 infantry. That, Sir, I think, is far too favourable a statement of our position at the present time.

Captain HIME: I said "less than." "On the 1st of January, 1873, our Army numbered 194,227 Officers and men. But where were they? There were 62,834 in India; 1,373 on their passage from India; 23,590 in the Colonies; and the remaining 108,618, of whom 62,334 were infantry at home. This grand result of our expenditure of some £15,000,000 was that the safety of the British islands was staked upon an army of less than 60,000 infantry."

Sir LINTON SIMMONS: And "surely it is sheer madness to risk our liberties in times like the present upon the success of an army of 60,000 infantry." Now, I quite agree with Captain Hime on that point—that 60,000 is too small a force for this country to risk its liberties upon; but, Sir, we have not anything like 60,000 infantry, effective for war. Every soldier must agree with me, that boys are not fit to serve in the Army, and certainly are not fit for war. What is the real state of the case? Our Government are so liberal that they publish at the small charge of sixpence a Blue-book, entitled the "General Annual Return of the British Army,"

which is in the hands of the foreign military *attachés* in this country, whose duty and business it is to study that return, and to send information derived from it to their respective Governments, who thus know to a man what our strength is, far better than the English public do, and far better than most of the soldiers or Officers in the Army. What, then, is the real state of the case? I will take my facts from this, and another published return, both of which are vouched by the signature of the Adjutant-General. On the 30th of November, 1873, the home Army consisted of 47,854 Infantry and 5,611 Guards, making together 53,465. Of these men, there were under twenty-one and over forty years of age 15,220; recruits above twenty-one, who had joined within the year, and, therefore, cannot be taken as trained soldiers, 2,697; there were sick and in prison, 1,844; Indian invalids, 973. (I am only taking the proportions of these latter that are due to the infantry.) Then there will be always some men at the depôts, and others employed elsewhere, and assuming these at the small number of 4,731, the result is that 25,465 must be deducted from the 53,465 so called effectives, which will leave 28,000 as the total real effective infantry at home, with the colours, fit for war. In addition to this, there are the Reserves; I see it was stated in a debate in Parliament a few days ago, that the first and second class Reserve amounted to 7,829 men; that there were 29,195 enrolled pensioners, who are mostly old soldiers over forty years of age, and therefore not fit for active service in the field; they may be very good for garrison duty, but they certainly are not fit to take the field. Then there are 28,226 men in the militia reserve; but from one return it appears that upwards of 10 per cent. of the militia deserted in one year, therefore there must be a very large proportion of these who would not be found; and besides, the proportion of boys under twenty-one is as large, or larger in the militia, than in the regular Army; therefore I put these down at about 17,000 men. And I maintain, from having seen several militia regiments, that they are not trained sufficiently to take their place in the ranks of the Army—they can only be looked upon as a reserve to fill up, after a few months' training, the first casualties that arise in war. What is the sum total, then, of this great force we possess? It is no use having cavalry or artillery more than in proportion to the infantry. Assuming that the regiments are raised to the standard laid down in the book put into all our hands to encourage the study of the art of war,—the rules for the *Kriegsspiel*,—and that they are organised in accordance therewith into brigades and divisions, I find that this infantry would suffice for four divisions. In other words, they might be made into two small *Army corps* of two divisions each; and supposing there were two brigades of cavalry, guns and engineers, to correspond added to them, they would altogether make up a small effective army of 46,051 men of all arms, with ninety-six guns. I think, therefore, Captain Hime is perfectly justified in saying we risk our liberties upon an Army of less than 60,000 infantry.

In making this calculation, I have assumed a point which I know is much debated, viz., that boys under twenty-one years of age ought to be excluded, in considering the fighting effective strength of an Army. On this point, I will read an extract from a lecture given in this room, by a medical officer of considerable repute and long experience, Dr. Leith Adams. He says—"It was a custom, in former times, "when the political state of Europe did not call for a large British Army, and "when recruits were plentiful, to select only men of large stature; but, in those "days, there were no camps, no manœuvres, or one half of the trying work to which "our young soldiers are now exposed, so that the lad of seventeen grew up to "manhood in easy country quarters, with far fewer chances of getting his frame "overtaxed than the youth of the present day; moreover, physically, he was better "fitted to withstand the strain. Now, it seems to me most advisable that, for "duty purposes, a very broad line should be drawn between the nature of the im- "mature and of the fully-developed soldiers." And now follows a statement to which I wish particularly to direct the attention of military men. "It is not only "pernicious to the interests of the Service, but also cruel, to expect a lad in his "teens to do the work of a full-grown man. I speak emphatically in the matter, "from the consciousness that the evil consequences of over-work, though apparent "to the surgeon, are not sufficiently estimated by many military men." As a military man, agreeing with Dr. Adams in what he says, I must repudiate the

idea that we do not "sufficiently estimate" these evil consequences. It is impossible for Officers, carrying on the duties of the Army, to draw the distinction he suggests. The only distinction that can be drawn is by not sending young men abroad; but when young men and old men are doing duty together in the same regiments, it is impossible to say that the older men, who are only receiving the same pay, are to do more duty than the younger men; therefore, we cannot draw that distinction in their duties that he would appear to desire between young men and old men. There is another medical officer, of very high standing, who is recognised and always quoted as one of the highest authorities on such matters, I allude to Professor Parkes. In his work on "Military Hygiene," he says, "If the State will recognise the immaturity of the recruit of eighteen years of age, and will proportion his training and his work to his growth, and will 'abstain from considering him fit fully for the heavy duties of peace and for the emergencies of war until he is AT LEAST twenty years of age, then it would seem that it is not only no loss, but a great gain, to enlist men early." I think, if we have soldiers in the Service who, in the estimation of the highest medical authorities, are not even fit for the heavy duties of peace, we cannot call them efficient soldiers for war. Dr. Parkes says *at least* twenty years of age. In the German Army, conscription begins after the completion of twenty years of age, but the fact is that a greater proportion of the youth in Germany are put back for one year before they are drawn into the Army. That is the result of the experience they have gained from the working of the law for drawing conscripts at twenty years of age. The Russians have adopted twenty-one years; and soldiers must agree that it is most desirable that we should only have mature men. What is the consequence if they are not fit? The young men, after some slight exposure and a few fatiguing marches, go into hospital and seldom rejoin the ranks. You will want far larger reserves, if you send these boys and old men to war, than if the Army is all of mature age. To show the importance, in an economical point of view, of this matter of age, I will refer to the Report of the Medical Department upon the health of troops in India. I find the death-rate per 1,000 of men under 21 years of age is 9.00; of men between 20 and 25, 17.30; between 25 and 30, 23.85; between 30 and 35, 32.99 per 1,000; between 35 and 40, 41.38 per 1,000; and over 40, 63.50 per 1,000. I have taken the trouble to make a simple calculation from the returns in which the ages of the European Army in India are given, on the 1st September, 1873, by which I find that, if the men in the Army had all been between the ages of 20 and 30 throughout the year, instead of being, as they were on that day, there would have been 380 fewer deaths in the year, 592 fewer men sent home as invalids, and 840 fewer men constantly in hospitals. In other words, the Indian Government would have been saved the expense of sending out 380 men to replace those who had died; of sending home 592 invalids and sending out 592 recruits to replace them; and they would have had a battalion of 840 more men effective out of that small Army of 60,000 Europeans, with which we hold 200,000,000 of people in check. The saving in money arising from this precaution, that is, by taking care that the men of the Army were all between the ages of 20 and 30, without allowing for any recruiting or depôt expenses, would be £230,000 per annum, which would go a long way towards improving the condition of the soldier, and in giving him better pay. Of course, this is not the place to enter into the details of these calculations. I have gone into them with great care, and I invite any gentleman to test their accuracy in any way he may think proper.

I will now make a few remarks on the cost to the State of recruits under age, because I think this is one of the most important points we can possibly discuss in this room, with a view to coming to a decision on this important question. I have made a table, showing the amount of money actually spent by the State in the wages and maintenance of soldiers in different branches of the Service. I must inform you that these calculations are founded upon the report of the Joint Committee appointed by the India Office and War Department, to determine the proportion of expenses to be paid by India for the Army, their instructions being that it was to be determined upon the basis of actual charges. I have taken their estimates, and only altered them so far as recent regulations required, and the following are the results:—A cavalry soldier costs, for his first year of service,

£71 4s. 8d.; an artillery soldier, £64 10s. 1d.; and an infantry soldier, £50 1s. For the second and subsequent years, the cavalry soldier costs, on the average, £82 8s. 9d.; the artillery, £49 8s. 4d.; the infantry soldier, £37 19s. 5d. Hence, if a cavalry recruit joins the Service at 16 years of age, it appears that, by the time he has arrived at 21, he will have cost the State £400; similarly, if he join at 17, he will have cost £318; at 18, £236; at 19, £154; and at 20, £71. In like manner, if a lad join the artillery at 16, he will, on arriving at 21, have cost £262; if at 17, £213; at 18, £163; at 19, £114; and at 20, £64. If an infantry lad be taken at 16, he will, when he arrives at 21, have cost the State £202; if at 17, £164; at 18, £126; at 19, £88; and at 20, £50. Working on the same basis, I find that the cost of training effective men for the Service in the three branches is £62 for the cavalry, £54 for the artillery, and £32 for the infantry. As an example, to explain the bearing of these figures upon this question, it will be seen that a cavalry soldier who joins at the age of 18 will have cost the country £236 by the time he has arrived at 21. Now, the training of a cavalry soldier costs only £62. Taking this sum from the £236, there remains £174, which this youth of 18 will have cost, on arriving at the mature age of 21 years, more than a man who had been caught just in time to be fully trained by the time he completed his 21st year. Such a man would have five years to serve to finish his Army service of eight years; the additional sum, therefore, paid for catching him as a young man amounts to £34 a-year for each year of his effective service, or is equivalent to an increase of 1s. 10d. a-day to his pay; that is rather a large sum to pay as a premium for boys. If it were added to the pay of the cavalry soldier, it would probably do away with the necessity of enlisting boys, or of discussing the necessity for conscription. Similarly, an infantry soldier, taken at the age of 17, costs £164 by the time he is 21; deducting from that £32, the cost of training an infantry soldier, there remains £132; as he will then have only two years to complete his Army service, each year of that service will cost £66, in addition to his pay, or 3s. 7d. for each day of his effective service. It strikes me that this would get us a better article, and I think it has a very important bearing upon the question whether Captain Hime, in his essay, exhausted the subject of voluntary enlistment. I have gone a little further with my calculations, and find the cost of boys who joined the Army under 20, during the year ended the 30th of November, 1873, on arriving at 21, after deducting the cost of training an equal number of men, would be as follows:—There were 9,858 boys, their total cost, without any depot expenses, would have been £741,037. That is a large item in the annual estimates. This sum would have been sufficient to add 5d. a-day to the pay of every man enlisted for the whole period of his Army service. These figures have a very important bearing upon this most interesting subject, but I can give you a few more which will, I think, cast a still stronger light upon it. Taking the returns of the last two years, I find as follows:—Of the 23,568 recruits who enlisted in 1871, 6,289 or 267 per 1,000, had disappeared from the ranks, in one way or another, before the end of 1873, and of these 6,289, 2,505 had disappeared in that year 1873 alone. Of the 17,791 recruits who enlisted in 1872, 4,196 had disappeared, or 236 per 1,000, before the end of 1873; and of that large number 3,514 had disappeared in 1873. Then, of the 17,194 men enlisted in 1873, 2,858 disappeared before the end of the year in which they were recruited. When we put these figures together, this remarkable result is obtained:—Out of the three years' recruits, of whom there were 58,553, one half enlisted for short and one half for long service, 13,343 had disappeared before the end of 1873; and, of those, 8,877 had disappeared in that year. What is the bearing of this upon the recruiting of the Army? Why, the whole question of voluntary enlistment or conscription hangs, to a very great extent, upon the number of men you want. If none of these men had disappeared in the year 1873, and not one of them, be it remembered, went into the Reserve, the Inspector-General of Recruiting, instead of requiring 17,194 men to supply the wants of the Army, would only have required 8,317, a great saving might have been effected in the recruiting department, and a great deal of embarrassment and trouble. Next, what has been the cost of these 8,877 men who disappeared during the year 1873, with less than three years' service? I make it that they cost the country, in actual money, £596,563, exclusive

of depôt charges; if the depôt charges are calculated, as they can be calculated from the estimates and other sources, you will find that the actual expense of the recruits raised at these depôt centres, in the year 1873, is about £86 per head; but, as the depôts were not in full operation for the whole of the year, they will probably improve very much, and may raise more recruits. Taking the cost, therefore, at £50 a-head, we arrive at the enormous sum of £1,040,000 which these 8,877 recruits will have cost the country during the short time, averaging less than one year, during which they had been in the Army. I challenge any gentleman to dispute those figures. I have gone into them with the greatest care, and believe them to be fairly accurate, and further, that the money thus spent would have done less harm if it had been thrown into the sea. Men entering and leaving the Army in such numbers, before they can possibly have rendered any real service to the country, unsettle their comrades and do much harm. So large a sum of money would go a very long way towards getting us out of our difficulties. We are apt to judge of the condition of the Army, and of its popularity with the classes from which recruits are derived, from the number of deserters, but I do not think this number, at the present day, affords anything like a criterion by which to judge of the difficulty of getting recruits. There is a far more important question at the back of it, and that is, whether the soldier is satisfied or not. With respect to men under six years' service, I find that, out of 24,594 who enlisted in 1870, 7,486, or 304 per 1,000, had disappeared before the 1st of January, 1874; that, out of 29,080 who were enlisted in 1868 and 1869, 10,479, or 360 per 1,000, had disappeared from the ranks before the end of 1873, 3,558 of whom had gone within that year. This looks very like dissatisfaction, as if the men are not satisfied with their position. Again, of the 86,041 men under twelve years' service, who enlisted in 1862, 1863, 1864, 1865, 1866, and 1867, 40,327 only remained in the ranks, while 45,714 had disappeared. These are large figures, and give the working of the Army, not from the experience of individuals, but from the experience of masses. Thus we find that 531 of every 1,000, between six and twelve years' service, had disappeared from the ranks, and of those 3,343 had disappeared in the year 1873. The total number of men who disappeared in the single year 1873, having less than twelve years' service, was 15,967, of whom 876 only were transferred to the Reserve. A portion of these, about one-fourth, may be accounted for by desertions, some were discharged as invalids, some died, and the remainder purchased their discharge.

The numbers who disappeared, in various ways, during the last five years, will give you a fair criterion of what the feeling of the soldier is. Of the men who were discharged in the last five years, 6,110 were discharged on completing their first period of service. Now, I think, considering that they had twelve years' service and only nine more years to serve for pension, the fact of their not re-engaging does not look as if they were altogether satisfied. 19,642 were discharged as invalids, and 12,088 by purchase. It will give you an idea of the estimation in which the soldier holds the advantage of the Army, when 12,088 men are willing to pay from £5 to £35 a-piece to get out of the ranks; 5,703 were discharged free by indulgence, or, in other words, gave up about £200 of acquired value in their prospective pension; 8,044 as bad characters, and 17,947 deserted, making a total of 69,534. During the same five years, there were 11,412 pensioned or sent to the Army Reserve, 11,331 died, and 7,547 left from unassigned causes. The total number that disappeared from the ranks was 99,854, including deaths and all causes, and I think we may safely conclude that 69,534 of these would not make known the advantages of the Army in a manner calculated to facilitate the operations of the Inspector-General of Recruiting. These 69,000 men would bring home the advantages of the Army to the classes who furnish recruits in much clearer and better understood terms than Army official circulars or letters sent by philanthropical Officers to the newspapers. They bear living, speaking testimony. I now think, Sir, I have adduced statements enough to prove that voluntary enlistment is not on its fair trial. I believe that, if it were put upon its fair trial, and if proper terms and proper conditions were held out to young men to encourage them to enter the ranks, and better pay given, you would have abundant men, coming voluntarily forward to serve in the Army, and who would not require, as the writer of the essay seems to think, additional money for the risk inseparable from

a soldier's life; all that they would ask would be, that they might serve their country, in an honourable profession, without loss of money. If an artisan enters the ranks now-a-days, who is in receipt of 4s. or 5s. a-day, he has to give up what is equivalent to fifty or sixty per cent. of his income for the honour of serving his country, and I do not think that condition can be sustained. We must pay men better. Having trespassed so long upon your time, I cannot now proceed to develop what I think should be done to place our Army on a right footing, but I think I have said enough to prove that something must be done to put voluntary enlistment on a better footing before it can be condemned.

Colonel LORD WAVENEY, A.D.C. to the Queen, F.R.S.: This is a discussion of a most important character. As I apprehend, it turns first of all on the means of raising our Army; the amount of Army we shall be able to raise; and for what purposes we shall design that Army.

I cannot think that there can be any very great difficulty in getting, under proper regulations, such as we may hereafter arrive at, the amount of available force that may be regimented for the public service. For instance, I see the Police Force perfectly filled up, I see the Railway Service kept in good working condition, and we naturally inquire why it is that the Military Land Service of all the services should alone be in this state of deficiency. There may be some points peculiar to this country, as indeed I think there are, but still they may be obviated. First of all, after remarking on the interest with which we must all have heard the details given by Sir Lintorn Simmons in which, however, the excess appeared to be as regards the payments we make and the deficiencies in the number of soldiers we raise; still I do not think it possible that in this country the period of military service can be postponed under our particular, economical, and industrial conditions, to the period at which the soldier would have passed, so to say, from the gristle into the bone. I have been particularly struck with that very great difficulty. The age at which we must take our soldiers, I apprehend, must be below that of perfect adolescence and capacity for enduring the severities of military service. But are there no means by which we may retain the soldier with the standards during the period at which he is growing to his strength? I presume the depot centres are intended in some degree to fulfil that duty; and supposing the youth of the Army, without reference to the particular battalions for which they were designed, were detained at home from foreign service until they were able to meet the necessary hardships of the climate, a great deal of the difficulty would be got over. That is merely as regards the physical circumstances attending our enlistment. But there are one or two other points, one of which has been discussed with great clearness and perspicuity by Sir Henry Havelock, in a paper published by him some two months ago, in which he speaks of the moral considerations that would attend the young soldier and the better classes in joining the Service; and he proposes a certain selection, as it were, to be made in the regiment, so that those who come from the more-educated classes should be associated together; and he proposed to form a lodging class answering to the one year's cadet of the German Service. There is no doubt a great deal of the difficulty arises in the barrack-room itself. I apprehend the educated young man who wishes to join the Service does not desire to live the life of the barrack-room, which, however well disciplined the regiment may be, must be unacceptable to him. I found a strange illustration in a very strange quarter, of the means of getting over that difficulty. My own idea was that the barrack system of England itself might be very much improved; but I am told something obtains in the Guards' barracks in this country which might be carried out more generally, that is to say, that the soldier from the time he leaves his barrack-room should never go to it except when he goes off guard to put on his "fatigue"; and that he should, during the rest of the day, be in public rooms for recreation, amusement, and so on—in fact that he should go through the life which most of us gentlemen, either at military colleges or at public schools, have ourselves gone through. Thereby—what is the most important point for the educated soldier—his self-respect would be preserved to him from the time he entered the Service until the time he quitted it. Sometime since, there was a discussion in the House of Lords on the convict establishment at Gibraltar, and that led me to talk to an Officer well acquainted with the convict system elsewhere. He said a great advantage was found in Portland from apportioning off the whole of the

sleeping accommodation into single cabins for the convicts. No doubt that system had a great effect in improving their condition; and if regiments were broken up into squads in that way, my impression is a great deal might be done by giving that opportunity of withdrawing, so to speak, from the ordinary rough life of the barrack which the well-educated young man would desire when he entered the Service.

There is another point on which I desire to speak. I turn to the finest body of soldiers in the world without exception, taking them on all points; and those who are familiar with them will justify my assertion. The 12,000 men of the Irish Constabulary have none superior to them in any part of the world. Bigger men there may be, but smarter men with their arms, or better adapted to learn every tactical movement, I do not know. Besides this there is an enormous amount of intelligence in these men, who, when in the Service, are always under the operation of a law of discipline and self-respect which develops their natural powers. I have heard of four foreign corps which are in precisely the same position. Perhaps some Indian Officer may be present who remembers Bailey's, and Skinner's, and Frazer's horse, and the Zemindar regiments. In the discipline of these two services was the soldierly self-respect that we want to develop, and it made such soldiers of them as neither India nor Ireland have ever before seen. I lay this before you to show that what has been done elsewhere may be done here. I have just returned from Ireland, and knowing that a discussion was likely to take place, I inquired what the rate of pay was for the youngest soldiers of the Irish Constabulary. I find, in a rough way, it is about £50 per annum. Those men find their own pensions, that is to say, they subscribe to a fund. With regard to the question whether we can improve the quality of our soldiers, it must always be borne in mind that the recruiting surface in England is limited, and that the productive recruiting power of this surface is limited also. We know that the rural population on whom we have chiefly to rely, does not increase; while the urban population does. I have found myself, from my own experience, with 3,000 young soldiers whom I have myself recruited, that the number drawn from the recruiting surface varies annually in a very trifling degree, though the men vary very much in increased efficiency and also in size. The recruits I got from 1853 to 1863 were small men compared with the men I have got from 1863 to the present time. With regard to the number of troops we may expect to have, taking the analysis of the gallant General that we have only 50,000 men and 100 guns—50,000 men and 100 guns handled as British soldiers ought to be, and projected after the fashion of British war, would create an enormous diversion in contests of whatever magnitude. The force of England must rest on the sea. The British soldier must not adventure in his comparatively small musters on the great plains where, by the mere weight of the enemies, he may be crushed. Let the British soldier be placed where he can communicate with the sea; and then will be seen what the military power of England is. The land military power of England is the small weight at the end of the steel-yard. It depends, for its force, on its place on the arm of the lever, and when placed right, there is no opposition that it will not weigh down. Let me give you an illustration with regard to the intervention of British soldiers during the French war. Supposing that, resting on the sea, we had sent our troops with 50 guns to the Seine, and a like number to the Loire, I think if the siege of Paris had not been raised, its history would have been very different. Under the shelter of the camp of Orleans, defended by British soldiers, the gallant young Frenchmen who perished in thousands would have had time to consolidate themselves; and I fancy it is probable the German piquets might never have been seen so far as the Loire or on the banks of the Seine.

With regard to the condition of this country, in speaking of the conscripts, Captain Hime has spoken of one conscription which is familiar to us all—the best conscription we have, the most effective, and one that has already done us good service, and that will continue to do so. I speak of the militia. In the militia, a force exists which, under the operation of the law, can be brought to the statutory level. Bring to the statutory level the operations of the militia, and it is sufficient to raise troops enough to defend this country. If the 50,000 men were sent on an expedition such as I spoke of, there would still remain at home a large body of men hardened to a great extent to the requirements sought of them, and needing only three or four months' drill to fit them for active service. My last suggestion is this. I see the

enormous difficulty at the present time of raising men such as we desire in sufficient numbers by our system of voluntary enlistment, even with increased pay or with the additional facilities in barrack life of which I spoke. I see that, but I do not see why the militia should not take their share of the national defence. If I have the good fortune to have an opportunity of giving my opinion elsewhere, I should propose, as during the Crimean war and the Indian mutiny, that some of the militia regiments should be always on foot. There we might meet the difficulty of age. Our recruiting power is a constant quantity. Men come to our service who are growing lads. They are able to get into half a year's work on the farm; and the rest they must make out as they can. I would keep the militia brigades on foot two years. The young men especially should be kept with their brigades, which, in succession, should take up their turn with the home armies. These men would be willing enough to remain in the first instance; and that gets rid of the great difficulty always stated with regard to the militia regiments, and they probably would pass on to the regular service. I must say, in conclusion, that whether, with regard to the armies we are to raise for foreign service or for home defence, I am still full of confidence; but I think we are indebted *most thoroughly* to Captain Hime for the light he has thrown upon many dark places of our system; and I trust he may long continue to give such illustrations.

Mr. HOLMS, M.P.: As I understand the time allotted to each speaker is very limited, I think it would be well for me to go at once to the practical points which, I take it, we are assembled to discuss, namely, how are we to get as good a supply of men for our Army as we get for any other employment in the country? I have read, with very considerable interest, the admirable Essay written by Captain Hime. I rejoice to see that he has come to one or two very sound conclusions. He does not believe in the militia, and supports the view that has been so ably put before this country by the gallant Officer who has just addressed us with so much ability, Sir Lintorn Simmons. I am glad also to observe that Captain Hime has come to the conclusion that it is possible to make an infantry soldier in a shorter period than three years. But I do not in the least agree with him that we have even approached the day when we need resort to conscription to obtain recruits. I would like to see the man who would be bold enough to go to the House of Commons and say that the day had arrived when we must cease to engage the British Police by ordinary and voluntary means, and must resort to conscription. The truth is, if the British Police were to resort for three months to the system that exists in the British Army to obtain men, in three months it would be precisely in the same condition as the British Army is now; but if the British Army were to take a little from the system of the British Police, they would arrive at the same result. Colonel Henderson, on the one side of Whitehall, has no difficulty in getting as many men as he likes; why should the width of the road preclude the Horse Guards from following the same example? If they did, the proposal of conscription would be equally uncalled for in the case of the Army as in that of the Police. It is the question of giving men that which will attract them. We must apply the same practical every-day simple mode of giving value for what we want. What would people think if this assembly was to come to a resolution that we were to buy Consols at ninety-two, when this morning the price is ninety-three and a quarter to ninety-three and three-eighths? Why the whole nation would imagine we had taken leave of our senses; and that is precisely the position we are in with our Army. Captain Hime has added much to our information. He has given us some very admirable returns. There is one which I have looked at with great interest, which shows that the market-price of agricultural labour per week in Northumberland and other counties is 14s., 15s., 16s., and 18s.; and what is your price? 13s. 1½d. Therefore you are just precisely in the position of offering a price so low that we have no hope of getting the men. But it is not a question of money only. Do not for a moment imagine that you will get the men, supposing you offered the money. The working classes of this country are a set of men probably higher in tone than many people are inclined to believe. Those men will not join the ranks until you show that you will take good care that men of good character only go into the Army. What do you do just now? You do the very best thing possible to keep men of good character from going into the Army. I see here one gentleman who

knows very well about the Constabulary, and I would ask anyone who has had to do with the Constabulary this question: Supposing a man came and offered himself to service, and you had arranged pretty nearly that he was fitted for that service, but you said—"Quite understand that you must be prepared at any moment to go to India, to go to the Cape, to go to the West Coast of Africa, or to go to Canada," what would the man say? He would say, "No thank you; good morning, I won't join." Another man comes who, perhaps, has a desire to see the world, and you come to precisely the same position with him, and then you turn to him and say, "I cannot agree to take you because you do not wish to stay at home." The man wants to go abroad; and, finding that he cannot be sent abroad, he says, "No thank you, I won't join." What is the result? The result is you have an Army of men who neither care where you send them or what you do with them. The best men avoid our service. You must have men who will be in this position—that not only will they do what you want, but that they will do it willingly. Certainly you are bound to have men who will serve you anywhere in case of war, but in case of peace why should you not give the man the choice of serving at home or serving abroad according to his wish? I believe our Indian and foreign service is most popular; and I believe also you might make your home service equally popular if we had a very short service, and gave them better pay and some prospect of a Government situation, and were also able to keep them in the Reserve by a very considerable retaining fee. There are of course a great many points connected with this question, but I will not trespass upon your time. I believe if you gave the men the choice I speak of, you would attract men of good character, and you would probably have a new class of men altogether. There are, at the present moment, abundant applicants for Government situations, and also for clerkships in offices in the City of London. I believe you will get that class of men to join the ranks very readily if they were put upon the footing to which I have referred. As to the question of getting men for voluntary service, it appears to me there is no difficulty whatever as regards numbers. At the present time we are enlisting annually, between the militia and the regular Army, something like 45,000 to 50,000 men; and, as regards our volunteers, I believe there is a number passing through the ranks of something like 45,000 annually. We have for the last five years been raising men at the rate of from 90,000 to 95,000 annually, every one by voluntary service, so that practically it appears to me there is no difficulty in getting men if we only organize the system upon such a footing as would attract the class of men we want, and had a real short-service system; as yet it has been so but in name. I believe until you cease to make the Army so easy to get into, men will not appreciate it at all. I believe if you stopped all recruiting for a month, and considered what should be done, men would begin to see you would not take on everybody that offered themselves, you might possibly, by-and-bye, begin to find some of the better class of men coming forward, even under the present system. The other day I was present at an inspection of recruits; there were twenty-five, of whom eight were very good men. I believe if they had accepted those eight, and said to the remaining sixteen or seventeen, "we have no room for you," the chances are, by-and-bye a better class of men would come forward; for the truth is we take anybody who offers. The question is so large, it would be impossible for me even to enter upon it. I have to thank you very much for the honour you have done me in inviting me here, and permitting me to offer these few remarks.

Colonel the Hon. F. THESTER, C.B. : The last speaker has fallen into the general error that appears to me to pervade nearly all civilians, that the Army is composed of the very dregs of the people ; and Captain Hime has given some colour to that opinion in saying that the Army is composed of the residuum of society. I think all Officers who have served regimentally will agree with me that the thoroughly bad character is the exception and not the rule. There are a great number of wild young fellows in the Army no doubt, but these are the very men who make the best soldiers ; and I should like to know if we were to enlist in the Army men only of approved, steady character, what would be done with the wild ones ? The fact is, the Army is really a grand reformatory for society, and I consider that it is an unmixed benefit both to the Army and to the Service at large that we should

recruit from the class which now fills the ranks. I do not mean to say I should wish to exclude those of a higher or better class ; on the contrary, there are prizes open to them in the shape of non-commissioned rank, which ought to be sufficient inducement to them to join.

Of course conscription is a very easy solution to the recruiting difficulty, but all those that have yet spoken have allowed it to be impossible, and it is useless to discuss that point. The question is how, if we were called upon to send an army into the field to-morrow, we could manage so as to efficiently recruit that army and keep it up to a proper standard of numbers and efficiency. What we want is no doubt that our recruiting system should be so improved that, retaining our voluntary system, we shall be able to spread over the length and breadth of the land our recruiting agencies, and thus obtain every man who has an inclination to be a soldier. I believe the brigade *dépôt* system, if fully developed, would meet the case as well as it is possible to meet it, but a real amalgamation between the militia and the line is indispensable. I do not agree with Captain Hime or with Mr. Holms in their depreciation of the militia. I believe it to be, when properly organised, a most valuable addition to our Army. I would completely fuse the militia with the line ; the militia should be the recruiting field for the line, and the present *dépôt*-company system which exists should be done away with. Let there be one or two companies of militia permanently embodied, and let them do the work of recruiting throughout the land. But before that could be well done, some change ought to be made in the officering of the militia. I do not wish to make any comments upon the present class of Officers ; I believe they are extremely good, but I do believe if it were made a *sine quâ non* that the Officers of the militia should be Officers of the regular Army, at all events in the higher ranks, that fusion that I advocate between the militia and the line, would be met to the fullest extent. Everybody remembers during the Crimean war the splendid militia regiments we had, and how, in many respects, they were equal, if not almost superior, to some of the line regiments ; but unfortunately they were of no use to us. They went to the Mediterranean, and there they stopped. When we had to recruit our Army, the reinforcements had to pass those men on their way to the Crimea. This must have been extremely galling to those militia Officers and men, and they must have felt that they were only considered fit to do garrison duty, but were not to be trusted to meet the enemy in the field. I believe if the organisation of the militia were so far altered as to allow that, by an Order of Her Majesty in Council, the militia, during times of national need, when we are sending forces abroad into the field, were liable to serve before the enemy, that instead of diminishing the recruiting it would rather increase it. Let us look to our militia as our reserve ; let them be blended with our regular forces ; let them be part of the line. Let our Officers go from the active Army to the militia, and exchange back again, if they please. Let there be a thorough amalgamation between the two, and I believe, in great measure, our recruiting difficulties would be met, and we should find, during war, there would be volunteers in plenty to recruit our force ; and, if necessary, we should have splendid regiments to take their place in the line of battle alongside of our line regiments.

Long service is far better than short, as the Army, under the present system, is not looked upon as a profession. I myself, from an experience of thirty years, can distinctly remember how, after short service was first introduced, a restless feeling was engendered amongst the soldiers which never existed before. When you enlist a man even for twelve years, he cannot realise that he is not going to leave the Army at the end of that time, although in all probability, when the time arrives, he is anxious to re-enlist. But, during the twelve years, his heart has not been really in his work ; he has been always hankering after home, and did not look upon the Army as a profession, in which he was to live and die. This restless, unsettled state has been intensified by the further shortening of the terms of enlistment. Therefore, I think, another solution of the recruiting difficulty would be to go back to the long service. I may mention incidentally that I cannot agree with Captain Hime in considering the volunteers "a harmless joke."

Captain HIME : I did not say so ; an Austrian Officer said so : I do not think they are a harmless joke.

Colonel THESIGER : I have the highest respect for the volunteers, but I think

their weak point certainly is the officering. If, when first organised, it had been made a *sine quâ non*, that they were to be commanded by Officers who had served a good apprenticeship in the regular Army, they would never have had the hard words thrown at them that they have now; but the good material exists, and the volunteers, if their services were required, would be of infinite value. In every change, the cost to the State must be taken into consideration. If we proposed to give our recruits £1 a-day, we should no doubt get a very efficient army. The Government, however, must cut its coat according to its cloth, and the State cannot afford to give perhaps more than it does now. The question is to see whether we cannot obtain recruits at the price we are able to pay. Everybody complains of the extent of the Army Estimates, therefore it is not likely that we shall be able to obtain for our soldiers a much higher rate of pay than they are now receiving. The condition of the British soldier has much improved of late years, and they are now extremely comfortable; they have excellent lodging, clothing, and food, and there is no doubt they have not too much hard work; the life of the soldier, in fact, is really a very happy one. One of the principal objections that has been raised to the system of long service is, that after fourteen or fifteen years a man is no longer physically fit to perform the duties of a soldier. There is some truth no doubt in this statement, but I think that a searching inquiry should be instituted into this matter, in order to ascertain how it happens that a soldier, after he arrives at the age of only thirty-eight years, having served say twenty years, is no longer fit for the active duties of his profession. I feel sure that any Officer who had reached that age would feel rather indignant if he were told he was no longer fit for active service in the field. The question is well worthy of consideration, how can we improve the health of our troops, and prevent them from so rapidly deteriorating, as no doubt statistics fully prove they do. To sum up the changes I propose, I would advocate that the militia Officers should be men who have served in the regular Army, and also that, if possible, the non-commissioned Officers should be of the same class. The younger the soldier, and the less time they are serving under arms, the more necessary it is that they should have experienced commissioned and non-commissioned Officers. That is the weak point of the militia. They are called out for forty-five days' training, and, to a certain extent, everybody is rusty. Naturally, therefore, their progress is not very great. But if they had thoroughly efficient Officers and non-commissioned Officers who had served their apprenticeship in the regular Army to instruct them, the training would be far better, and the results much more satisfactory. I should like to throw the whole duty of recruiting upon the militia. They should not only enlist for some particular regiments, but the brigade-depôt-centres should be opened to every regiment in the Service. As there would be no line-depôt-companies in existence, there would be no likelihood of any favouritism in favour of one particular regiment, and by this means I believe we should tap the resources of the country to the fullest extent.

One other difficulty in the regular Army—recruiting for long service, is, that when in India many men are found physically unfit to remain in that country; they come home, and what is to be done with them? It appears to me if a man engages to serve Her Majesty at home and abroad, and fails in that condition through ill health, it is an unfortunate circumstance for him, but he is no longer entitled to receive the benefits held out to him when he enlisted. He ought to be draughted out of the regular Army, and put into the Home Reserve. The regular Army would thus consist entirely of able-bodied men fit for any service, and the Home Reserve would gain in strength and efficiency by the arrangement, whilst the State would not be put to any extra expense.

As regards the changes in the regular Army, I would advocate long service enlistment to the fullest extent. I would allow every man to remain in the Service as long as he was able to bear arms either abroad or at home, and at the end of his career let him retire with the pension he has fairly earned. After very careful consideration of the subject, I have come to the conclusion that we make a mistake in discharging men from the Army on account of bad character. There is no doubt we inflict an injury on society by turning adrift men who are considered unfit to remain in our Army. They cannot possibly earn an honest livelihood, and to exist, must prey upon society, and eventually become a charge upon the State by being sent

to prison. We want reformatory battalions as there are in other countries, which should be able to take these men and try and make them better, or at least keep them from annoying the well-conducted. Imprisonment for military offences might, under such a system, be almost done away with. At the present moment, how many men in the Army are throwing their duties upon their comrades by being in prison for offences which would be considered very light in civil life? If imprisonment were done away with, it would give more nights in bed to the soldier, which is a most important point from a sanitary point of view, and would act beneficially upon the conduct of everyone in the regiment. Desertion is the great difficulty of the present day, and so long as we continue to enlist men for short service, it is of great importance to find some means of checking it. My remedy is as follows:—Let every soldier convicted of desertion be held liable for general and unlimited service, and let him be at once sent to a regiment in India. Such a measure would, I believe, at once stop the professional deserter, and the Army, both at home and in India, would be benefited.

Major-General Sir E. WARDE, K.C.B., R.A.: Having been permitted, only the day before yesterday, to occupy so much time in this room, I propose to detain you a very few minutes now. When I read the Prize Essay, it appeared to me that the principle upon which Captain Hime proposed that the Army should in future be maintained was utterly impracticable, for this reason, that public opinion, universally expressed, admits that the country is not prepared for, and would not accept conscription. That being the case, it becomes necessary to propose some alternative method that the nation would accept, and which the Government would not hesitate to propose for adoption. It has been a great gratification to me to find that there has been much concurrent opinion expressed with regard to my counter proposal. Voluntary enlistment was the principle upon which I proposed that the Army should be maintained, and that, I think, apparently has been received generally as the system upon which we ought to man our Army in the future, as we have hitherto done in the past. Long service with pension, I propose as the best means of inducing men to enter the Army. That also appears to be largely accepted, at all events, by those who have spoken this afternoon. My friend, Sir Lintorn Simmons, says, "No! no!" He is opposed to it, but he argues that some stronger inducements should be held out to attract men to the ranks. I do not agree with Colonel Thesiger in thinking that we give men as much as we ought, to induce them to join the Army.

Colonel THESIGER: I did not mean that; I meant, we give them as much as we can afford to give.

Sir E. WARDE: I beg to differ with you there, also. I think, in this rich country, when you consider that maintaining the Army is simply insuring the national property at home, and securing its honour and prestige abroad, you would find, if it was put to the vote, that ninety-nine men out of every hundred throughout the country would not hesitate one moment to pay whatever might be necessary to obtain such an Army, both as to quantity and quality, as is now required. Put an additional tax against conscription, and where would the votes be? All I wish to say further upon the subject is, I desire nothing more than that the Prize Essay and the proposal I have made should be put side by side, and read paragraph by paragraph, and I venture to think that the strongest possible arguments will be found in the Prize Essay itself in favour of the system that I have proposed for manning the Army in future.

The discussion was then adjourned to Monday, the 12th instant.

Monday, April 12, 1875.

(General Sir WILLIAM J. CODRINGTON, G.C.B., &c., &c., in the Chair.)

ADJOURNED DISCUSSION ON RECRUITING.

The CHAIRMAN: Before we commence the proceedings, Sir Edward Warde wishes to add one or two words to what he said on the previous occasion.

Sir EDWARD WARDE: As you have given me permission, I should like to say just three words with regard to some remarks that have been made about the militia and volunteers. I totally and entirely differ with my talented young friend, Captain Hime, in thinking that the militia or volunteers deserve to be spoken of with any other feelings than those of high respect, because I am able, from personal experience, substantially to corroborate what Colonel Thesiger said here last Friday, about the efficiency of the militia infantry, both during and immediately after the Crimean war. And I know, from my own personal knowledge, speaking of the artillery of those two branches of our reserve forces, that there is a large number of excellent good garrison gunners in both of them, and, if I were charged with such a responsible duty, I should not hesitate for a moment to place them in charge of our garrison artillery defences, with two single provisos:—first, that the duties, although they should be, of course, conducted by their own Officers, should be superintended by Royal Artillery Officers; and, second, that they should have amongst them a sufficient number of thoroughly trained and well instructed Royal gunners, to perform those special and peculiar duties which never ought, under any circumstances whatever, to be entrusted to less skilful or experienced hands. I think it is due to both those branches of our auxiliary forces that so much should be said.

Lieutenant-Colonel PONSONBY COX, R.E.: The ground taken by the essayist appears to me to be that, having received three distinct systems of voluntary service, first, the life-long system; secondly, the long-service system; and, thirdly, that which has partially, but not wholly replaced it—a system which is called, or rather mis-called, a system of short service, he has passed judgment upon each one of them, and has pronounced that, for the purpose of adequately supplying our Army with recruits, each has proved to be a failure; thence he has gone on to argue that these three systems being failures, there remains for us no other alternative save at once to have recourse to universal conscription.

First of all, as to the first—the life-long system. That is a system so wholly of the past that I think it quite unnecessary for me to further refer to it. Next, as regards the second system, commonly called the “long-service” system. This has, with the preceding system of life service, one common principle, viz., that under it service is voluntary and continuous. Captain Hime has so extremely ably stated the case against that system that, although agreeing with him that it may possibly be maintained in a modified form for the purpose of providing soldiers for our colonial service, I consider that, as a system for the purpose of supplying the home Army, it is practically dead. I, therefore, shall not occupy the few minutes to which we are very wisely limited by the rules of this Institution, by saying anything further about it. I shall, at once, turn to that system which has been comparatively recently introduced to replace the system of long voluntary service, I mean the system introduced by Lord Cardwell, in 1870 and 1871, and which now obtains. I shall endeavour to examine, as briefly and as rapidly as possible, whether that system be, as alleged, a failure, and, if it be a failure, whether its failure is a consequence of defects that are absolutely inherent in every voluntary system of

short service, or whether its failure is in consequence of defects which are remediable and avoidable.

First of all, in order to be enabled to judge whether it is a failure or not, it is necessary to bring it to some standard, and I apprehend that the one standard to which we must bring any system of service which has replaced a longer by a shorter term, is to ascertain whether such system does or does not provide a greater, a more abundant flow of recruits than the one which it supersedes, because it is transparently evident that the shorter the period of service, the greater the number of recruits you require. We must, therefore, satisfy ourselves whether this system introduced in 1870 has or has not come up to that standard. It is quite clear, when the present system was introduced, it was evident to the mind of its author how absolutely essential it was to its success that it should fulfil the condition of increasing the flow of recruits. In March, 1870, when the system was being explained to the House of Commons by Mr. Cardwell, it was pointed out that its one merit was this—that it was calculated to attract to the Army, in large numbers, a class of men at present deterred from entering it. The words of the Secretary of State for War were very well weighed and precise words, and I think explain precisely what I mean upon this point, in language very much better than my own. Lord Cardwell, March, 1870, speaking of short service, said:—"I hope for better things. I look forward to seeing the broad line of demarcation between the Army and civil life somewhat diminished. . . . We think this engagement, from its nature, will be the means, if it succeed at all, of drawing into the Army a large number of men who, otherwise, would never join it. To those who say we shall not get recruits under our new plan . . . I say, 'You and I are talking of two different persons. You are speaking of the man who now joins the Army . . . but I speak of the man who does not now join the Army, but whom we wish to induce to join it; of the young man who is reluctant to spend all his life away from his own village—who may wish to contract marriage.' . . . There must be inducements for these to enter the Army, for they do not enter it now."

Now, Sir, have these promises been, in any sense, fulfilled? Has Lord Cardwell's system succeeded in attracting into the ranks of the Army large numbers of men of a class superior to those heretofore entering it? We have had statements in abundance to prove that they have not. We have the statements of facts carefully collected and laid before the public by Mr. Holms; we have had the statements of facts collected and the arguments laid before us by Captain Hime, the author of the essay under discussion, collected in a manner so able as to have obtained for him the high distinction of the blue riband of this Institution, which prove to conviction that Lord Cardwell's system has entirely failed either to improve the quality or to increase the quantity of recruits; but, further than that, we have evidence to show that the men who are now joining the Army, if they differ at all in quality from those who formerly joined it, certainly differ for the worse. In a speech, the importance of which it is impossible to overstate, made by the Secretary of State for War this year, Mr. Hardy said, "It must be admitted the Army is not recruited from that class of men which my predecessor hoped would come into it." Those words emphatically and entirely condemn the system which at present obtains. I think it may be taken as established that that system is, for the supply of recruits to the Army, in sufficient numbers and of suitable quality, an absolute failure.

I now propose to examine whether the failure is from defects which are inherent in a voluntary short service system as such, or whether they are defects which might have been avoided. In examining that system, it at once appears that the failure has arisen from an attempt to apply to home service, and to foreign service, one and the same species of enlistment, and the same terms of engagement. That attempt has resulted in the adoption of the "six years'" service, which is at once too short for the Indian service and too long for the home service, which, in fact, is neither fish, flesh, nor good red herring. I think it is transparently evident that the attempt to apply this to two services so utterly different in their requirements, must lead to inevitable failure. That being the case, I again find myself in agreement with Captain Hime, as to the necessity of making separate and distinct provision

for Indian and home service. I say it is absolutely necessary to engage men for each on distinctly different terms: for the Indian service men must be engaged for a comparatively long period of continuous service, whilst for home service we may apply, in the fullest meaning of the word, a short service system. For Indian service, it is self-evident that a six years' engagement is entirely too short. The great majority of men enlist at about eighteen years of age. There are strong objections to sending those men to India till they have become matured, and I believe that, as a matter of fact, they are not sent out till they are twenty. There are, thus, two years gone out of their six years' engagement, and only four years remain to serve in India, from which there must be deducted the time consumed in their voyage out and home. That is a system of which the false economy is so evident that I need not further refer to it. And now I ask, why has Lord Cardwell's system failed in its application to the home service to do that which it promised, namely, to attract a better class of men, in sufficient numbers, into the Army? I think the failure to attract good men arises from these particulars:—first, the uncertainty as to the conditions of service to which a man commits himself when he takes the shilling. At present it is a complete leap in the dark; he cannot know whether he is to serve at home or abroad, or where abroad, or in what proportion at home or abroad his term of service will be spent. This element of uncertainty I consider to be the one which is, perhaps, the strongest deterrent of all to that better class we desire to attract to the ranks. We know that men can be found to engage for a long period of service, in a foreign country, if that period be a defined period; if they know how long they are engaged for, and where they are going to be sent. We know that, because the experience of previous enlistments, for the exclusive Indian service, has shown it. We also know that, on the other hand, there are men in abundance who would be prepared to join a home Army, but who would be deterred from doing so by a liability to go abroad. But for the men who are quite willing to commit themselves to a distinct term of engagement abroad we do not bid, neither do we bid for those who wish to stay at home. We do not bid for those who have any thought for the morrow, we only bid for the reckless and thriftless, for those who go into the Army as a final resource, and because they do not see their way to doing anything better—men absolutely and entirely without forethought. These are the men we bid for, and these are the men we get, and we do not like them when we have got them.

Then what is the remedy? Surely by offering distinct terms to both, a distinct engagement for a period comparatively long for India, and short for home; and I at once wish to say we can do that without in any way involving the necessity of reverting to the old system of two distinct Armies, for India and elsewhere, or disintegrating in any way the present system which obtains. The regimental system would not be in the slightest degree dislocated by the method I propose. Taking the infantry as being the least complex arm of the service, and therefore best suited for the purpose of illustration, what I propose could be effected by dividing each regiment into three battalions, the one to be a foreign battalion, and the remaining two, home battalions; let the home battalions be always quartered in Great Britain or Ireland, and let the foreign battalions be permanently stationed abroad; let the men enlist for these several battalions on distinct terms. For the foreign battalions, say for seven or ten years' continuous service; for the home battalions, men would enlist on terms to be hereafter described. Let the men being engaged for the several battalions be not interchangeable, as they now are. The Officers, on the other hand, being engaged for the regiment, and not for the battalions, would be interchangeable between the battalions of their regiments, and serve in each as required, according to roster and in regular rotation. This arrangement, I think, would dispose of the difficulty arising out of the requirements of foreign service. It would clear the ground, and enable us to apply to the home Army the short service system in its fullest sense.

Let me now describe the terms upon which the men ought to be enlisted for the home Army. I think these men ought to be engaged for a period of nine years, of which three should be passed with the colours, in order to form them into soldiers, and six should be passed in reserve, during which latter period they would still remain (not turned adrift into that inchoate mass called the Army Reserve), but

forming the reserve of their several regiments, still attached to their regiments, and belonging to them until the last day of their service; so that, should the Army require at any moment to be mobilised, these men would know, and exactly fall into their proper place in its organisation. As to the terms which we should offer to attract them to our service, they would be these—for the three years' service, which would be their definite term of service with the colours, I should propose that the pay should be somewhat as it is at present, perhaps slightly enhanced, and that the main attraction held out should be a substantial reward in the shape of pay during the six years' period after they were made into finished soldiers, and were really valuable. If men could, by serving three years in the Army in the way I have proposed, secure for themselves a substantial reward, say of 7*s.* a-week, or £18 a-year, for every year of the six, I think that would be sufficient to attract men into the Army who now do not enter it. I think we could fairly go down into the market, and bid for the best of unskilled labourers and the pick of the agricultural population; and those are the men we want. We cannot bid for the skilled artisans, they are too costly for us. This would obviate at once the necessity for our seeking in highways and byeways for recruits. We might, I think, withdraw the whole of our recruiting staff, and trust to the offer of fair market terms to secure an adequate supply of recruits. As soon as this system had been three years in operation, our very best advertisements would be the men I have spoken of—the Reserve men—with 7*s.* a-week in their pockets. An unskilled labourer, who found he could earn for six years 7*s.* a-week on those terms, would be a standing advertisement which would attract men in any number into the Army. We should then be able to pick and choose our recruits, and not being under the necessity of taking everyone who chose to offer himself, and who measures a certain number of feet in height, and a certain number of inches round, we should be able to reject the morally halt, lame, and blind. The corner would be turned, and men who are now deterred from our service by knowing the low class of comrades they would find there, would then be attracted to that service by knowing that they would find in the ranks respectable men of their own class and standing.

There is one thing which is absolutely essential for the working out of this system, and I shall endeavour to state it as shortly as possible. I have said—if we are to rely upon men in the reserve, we must not only know that they are there, but we must rapidly and immediately be able to lay our hands upon them, and they must be able to return in a very few hours to the regiment to which they belong. That brings us to the necessity of not only keeping the home battalions at home, but also keeping them within a certain defined locality at home; not essentially of narrow limits, not a town, not even a county, but a group of counties, and, in fact, it brings us at once to localisation and the formation of army corps. That is an essential to the scheme I propose, because it is absolutely essential that the men who are in the Reserve, and the regiments to which they belong, and of which they form the reserve, should be near each other, and that can alone be secured by keeping groups of regiments within military districts. I am afraid, in attempting to condense my remarks, I have not clearly explained my proposition; at the same time I hope I have said enough to induce those who hear me to believe, that of which I am convinced, viz., that we have by no means exhausted in this country the voluntary short service system; that we simply have to apply that system thoroughly as it would be applied by a man who was convinced of its merits, and had the courage of his convictions. Its admitted failure, I venture to say, is by no means inherent in the scheme itself, it is simply from the mode of its application. I am myself convinced that if it were properly and efficiently applied, it would be utterly unnecessary, as I believe it is absolutely impossible in this country, to have recourse to conscription.

Lieutenant CHAMPION, R.M.L.I.: As I joined in the competition for the gold medal, perhaps I may be allowed to make a few remarks upon the grave question that is before the meeting, especially as I took an adverse view to that taken by Captain Hime. The idea, Sir, forces itself upon me, that if the proposals of Captain Hime were applied to this country, however necessary, they would be looked upon as a national calamity, and this compels me to rise in support of a tottering voluntary system on which, in a very brief essay, I have treated. I stand at a disadvantage

in two ways. First, it is easier to attack than to defend a system that is falling in military estimation, and that has heretofore failed to perform that which has been required of it; and, in the second place, in common with others, I have been beaten in the contest. With regard to the first, although I find difficulty in dealing with it, yet I am not disposed to desert it; and with regard to the second, inspired by that courage with which Louis was animated when he fought at Dame Europa's school—I cry, "*Vive la guerre!*" and rush, but I trust not blindly, at my foe. But then, Sir, I can hardly look upon a contest of this kind in any other light than that of a simple duty, because we ran side by side rather in a common cause to obtain a result that might prove an advantage to this country. At the last discussion, while the majority of the speakers imparted to us much important information, they appeared to depart from the main subject before us, which was the question of "*Conscription versus Voluntary Service,*" as proposed in Captain Hime's pamphlet. To show conclusively that conscription, and conscription alone, would satisfy all the requirements of the country, is *the great task*, and very ably has the gallant Officer attempted it. I understood Captain Hime to say, that he did not *like* conscription, but that he considered it was inevitable. Now, Sir, I would like to ask when this eventuality is to take place, and in how many years would conscription become a positive necessity. If conscription is alleged to be inevitable, then I maintain that that statement is a prophecy, and all prophecies should be received with caution. It appears to me we must be convinced first of all that the voluntary system, when properly applied, has failed, and, in fact, that it will place the country, if we continue to make use of it, in a very dangerous position, and that conscription alone will save and protect her. If conscription is to be received by the country we should receive it at once, and put it immediately into operation; but if, on the other hand, it is not necessary to introduce this conscription, I presume we have time to talk about it. I join issue with Captain Hime on one great point, and it is the point from which both of us must start, namely, that the voluntary system has been shown, *when properly applied*, to have failed. I maintain that throughout all his remarks, and multitude of quotations, he has never once shown that the voluntary system, when it has been properly applied, has failed. If Captain Hime has failed to do this, I think conscription may hide its dragon-head until some immediate national necessity calls it to our aid. I do not at all agree to some of the proposals with regard to supplying the ranks of the Army with volunteers from the militia. The proposals that were made last Friday, and that seemed to me to meet with general approval from the meeting, I look upon as unwise, because if you rob your militia service of its men, you naturally weaken the great territorial reserve; and you not only do this, but you also destroy that interest which it is absolutely necessary Officers should take in the instruction of their men, and you very seriously impair the efficiency of that service. I do not mean to say it would take very much to impair the efficiency of the militia service, but that is not the fault of the Officers. Whose fault it is, it is not my place to state, but if the militia were founded on the very finest system in the world, if you were to rob it of its men, and draught them into the Army, you would materially destroy its efficiency. If any thing will induce men to join the Army at all, they will join it at once. I suppose the object of serving with the militia is to remain at home; and here again I join issue with Captain Hime, that the Army should have its foreign service character destroyed. I beg to point out that a similar system with regard to the English Army in India has done and is doing incalculable damage. Men are draughted from regiments to fill the ranks there, a proceeding which is not only destroying the *esprit de corps*, but is giving Officers great cause of complaint. If conscription is to be accepted, further discussion in favour of the voluntary service may be dispensed with; but if we can deal with the difficulties, conscription need not be accepted. The great difficulty we have to contend with in voluntary service is, that that system compels us to lengthen the term of service to that extent that will make it worth our while to give soldiers a pension for serving; and, on the other hand, make the pension worth the soldier's while to serve for it. If in Germany they had to contend with a voluntary system like we have, with all their military excellence they would be just as much embarrassed as we are, and more so. If the nation is willing to pay for the privilege of maintaining an army on the

voluntary principle, I think by all means she ought to be permitted to do so. We are a very great and rich nation, and I consider that whatever little extra necessary pressure was put upon us, it would not very seriously be felt, and if the Army could be only made to produce the results required on the voluntary principle, I think the nation might bear the expense. In the system which Captain Hime has proposed one matter attracted my attention. He says there should be a judicious system of exemption. Now, in Great Britain, I maintain that would be a very serious matter. I do not think it would be very well received. We are a peculiar people; we have rights and liberties, and all that sort of thing, and we like to hold on to them, and if we made invidious distinctions, he would be a brave man and able, who attempted to grapple with the difficulty. I cannot give Captain Hime credit for ignorance of that jealousy with which every Englishman, from the highest to the lowest, regards his personal liberty. If his suggestion is to be carried out, you would have invidious distinctions, and it would be as well to try and avoid a system that would introduce such a disagreeable law as that. There have been three great mistakes made with respect to the voluntary system. We have forgotten to make service in the reserves compulsory, except in the case of the old pensioners, and really I do not think that that force is worth thinking of in a question of this kind. Secondly, we have failed to consider the services of men of ten and fifteen years' service as of any value; and we have, thirdly, failed to look upon service in the reserves as worthy of any increased pension. I consider that these three things are very important. They may be little details, but it is upon a perfection of details that the whole military machine depends; and I suppose nothing would induce men in the labour market to join the Army more than proper pensions being given for ten, fifteen, and twenty years' service, while service in the reserve should, if made compulsory, receive its due reward in the shape of increased pensions. The system I proposed, was that there should be three periods of service, ten, fifteen, and twenty years, with three reserves, corresponding with those three periods, and five years' service required in each of the reserves; that you should demand from every man twenty-five years' service to the State; that a man who left the Army at ten years should go to the first, then to the second, then to the third reserve, and so complete his twenty-five years' service. That a man who completed his fifteen years should go to the second, then to the third reserve, and complete his twenty-five years' service; that a man should, who completed his twenty years, go to the third reserve; and then, about his business, having completed twenty-five years' service. I show by my scheme, roughly, that I would in five years produce a reserve army of about 55,000 men, or between that and 60,000 men, supposing the English Army of course is kept at its usual strength of 200,000 men. In ten years it would be considerably more, and in fifteen years a reserve of at least 130,000 or 140,000 men would be at the disposal of the Army in case of war. As this is a matter which does not directly affect my own profession, I ought perhaps to make an apology for handling it; but, Sir, few Officers have the opportunities of ascertaining the wants of two great professions more correctly than the Officers of the Royal Marines; we know them both; we understand their differences, and we know what one could gain from the other which would add materially to the advantage of each. Therefore, perhaps, I may be pardoned for making some remarks on a subject which does not directly affect my own profession. As a soldier, I have no politics, but there is one question I would ask, and I do so with all due respect; it is a question which must be decided before any Officer can form an idea of what is required at the hands of our Army. Sir, is it the intention of Great Britain to uphold her treaties and foreign obligations to the last shilling in her exchequer, and the last man in her ranks? If so, then I think from the present aspect of Europe, the sooner conscription is put into operation the better; but if, on the other hand, we are spared a few years of peace, and can rely upon it, and that international courts of arbitration will be found to perform satisfactorily the duties we require of them, then, Sir, I will express the hope that the improved voluntary system may be adopted; but all these matters being in the hands of able ministers, as soldiers it is our duty to await their decision.

Colonel LEAHY, R.E. : It is now over eight years since the subject of recruiting became a public question of great importance, and it is very much to be regretted

that there is no general concurrence of opinion as to the course we ought to adopt to fill up the ranks of our Army. This, I believe, arises from the fact that there is no precise and authoritative statement as to the objects and duties which the British Army is intended to fulfil.

A consideration of the "varied duties of the British Army in peace and war," would, in itself, be subject for an essay. Those duties cannot be considered apart from the duties of the Navy, which has been, and ever will be, the first line of defence for this country. I, therefore, think it is to be regretted that some intimation of the duties expected of the Army, and of the principles on which it ought to be recruited, was not given for the guidance of intending essayists. Had that been done, I think we might possibly have been brought to more general agreement as to the mode of filling up the ranks of the Army.

Captain Hime truly says the question of life-service as distinct from limited service is a political one. It has, however, been laid down by Parliament that the Army shall be modelled on the principle of short service, which was held by Lord Cardwell to be at the very root of army reform; and, if our discussions are to be of any use, they must be directed to considering in what way the requirements of the country, as laid down by Parliament, can best be met.

Captain Hime says that "universal conscription, without substitution or dotation," is the "best means" and the "only means" of "providing recruits and for forming "reserves for the British Army;" and he sets forth a valuable collection of facts, quotations, and arguments to prove his case.

Sir Lintorn Simmons has, I think, disposed of most of the arguments; but there is one fact that Mr. Holms mentioned which I think renders a discussion on conscription futile, namely, that a proposal for a conscription would not be entertained in Parliament. So long as that is so, it is no use for us to discuss it. Our object should therefore be to consider how men in sufficient numbers may be induced to join the Army and its reserves "on the same prudential grounds that they adopt "any other profession or calling," and to arrive at "this stage of civilization" without excessive or wasteful expenditure.¹

While, therefore, I entirely differ from the conclusions at which Sir Edward Warde and Captain Hime have respectively arrived, I can support many of the professional points on which they have given us the benefit of their experience and opinion.

In the first place I am able, confidently, to support the conclusion at which Captain Hime arrives, that if the system of short service be carried out with a will, recruits, representing the average intelligence of our industrial classes, may be thoroughly instructed in all the duties of an infantry soldier in about one year. This opinion is formed after experience of the last three years, during which time over 1,200 recruits for my own corps² have received great part of their training under my personal superintendence; while, during the same time, about 800 line soldiers have also received special instruction under my immediate direction.

I therefore feel confident that in one year recruits may be instructed in their duties, and that one or two summers of subsequent residence in camp, with attendance at autumn manoeuvres, would complete their training as soldiers; so that, provided they were physically fit, and were immediately commanded by the Officers with whom they would be likely to be associated in service, they would then be thoroughly efficient to take their places in a field army.

I may here observe that, having during the last summer been present with a force comprising detachments from five different army corps of the German Army, I found that there were very few private soldiers in the ranks who had completed two years' service. The men in their third year of service were almost invariably employed on some regimental special employment, or in some few cases they

¹ Prize Essay, page 12.

² The time actually taken for training as infantry and engineer soldiers the recruits for the Royal Engineers, averages about 18 months. During 12 of these months the men are employed for four days a-week on technical instruction or at their trades.

were non-commissioned Officers. They were, of course, all over twenty years of age.

I would here repeat what I have, on former¹ occasions, strongly insisted upon, viz., that short service to be successful must be really short service. The service at home required to train the soldier for his duty would extend over three years, but that three years may comprise a considerable time devoted to industrial training. I will not take up your time by going through the details of the proposals² I have made; but the views I have set forth on army reform are almost identical with those which Colonel Cox has now put forward as his.

Reading from a paper printed April 26, 1867, I then suggested :—

1. The division of the period of the service of the regular soldier into three classes, viz. :—Service at home, service in India or the colonies, and service with the reserve forces.

2. The regimental organisation to be such that each regiment should contain a proportion of each of the three classes above enumerated.

3. The extension of the system of reserves to those colonies which are supposed to contribute men for their own defence.

I conceived that under these proposals it was possible to render the service attractive to a superior class of men to those who then enlisted, and to make dismissal from the ranks a real punishment. I then proceeded to define the period of service in India and the several colonies, adapting it to the climate and so forth.

I believe with Lieutenant Colonel Cox and other speakers, the dissatisfaction created by the existing arrangements to be in no small degree due to the attempt to combine short service commencing at 18 years of age, with an engagement for limited service in India and the colonies, an employment which should be provided for by a separate voluntary engagement for long service.

The full development of the regimental system is, I think, essential, and each regiment should consist of two or more battalions. The establishment of a regiment should include not only the trained men with the colours and the men under instruction, but also those able-bodied men who, having passed through the ranks, are held in reserve to fill up those ranks, in case the regiment should be called upon for service.

To carry this out, the recruiting should take place for particular regiments, and the regimental reserves should be under the control of the Colonel commanding the regiment.

The numbers under training, and the numbers of trained soldiers present with the colours, might vary with the exigencies of each year; but the establishments of our Army should, after due deliberation, be laid down once for all, and it should not be within the power of the Minister of War for the day, to prepare annual Army Estimates based on a variation from those establishments, without first taking a formal vote of Parliament on the subject.

In order to keep up our Army at its present strength, the numbers to be annually trained in the head-quarters of each double battalion regiment should, at the present time, be somewhat about 300. Of those, 100 would be required to meet the demands for permanent service in India or the colonies, or as non-commissioned Officers. The remaining 200 should be remitted to the reserves; and there should be a discretion given to the Officers commanding the regiments as to which reserve the men should go to. There should be "Regimental Reserve" men required to fill up the regiment, the "Militia Reserve," and the "Volunteer Reserve," and inducements must be offered accordingly. A soldier who had served satisfactorily in the regiment should, within the limits of approved numbers, have an option as to which reserve he would go into.

The next point of importance is the necessity for good non-commissioned Officers, to whom suitable pay should be given. On this point I entirely agree with Sir Edward Warde who says—"They are the connecting links between the Officers and

¹ Vol. xiii. pages 177 and 495, } Journal of Royal United Service
Vol. xv. page 307, } Institution.

² See papers read at Royal United Service Institution, April, 1868, and February, 1871, vols. xii. and xv. of Journal of the Royal United Service Institution.

"men, and it would be impossible to maintain a high state of efficiency and discipline "without having in these positions men of high moral character, and rather more "than the average ability." Now I have had personal experience of this in the training of recruits, for, at the School of Military Engineering, we train about 400 recruits a-year. For the technical training of these recruits a non-commissioned Officer, selected with the greatest care for his military and professional qualities, is made a Staff-Sergeant Instructor. This non-commissioned Officer takes about 40 men through the course of instruction, and for about a year they are under his influence, and I find that the character of the non-commissioned Officer reflects itself in that of the men whom he has trained.

As a means of attracting men to the ranks, and providing a contented and efficient reserve who would act as recruiting agents, we must not only pay the market value of the class of labour we desire to obtain in the ranks of the Army, but we must liberally pay the reserves, and especially the regimental reserves.

It is, however, most necessary that for men engaged to serve on a contingency there should be a prospective pecuniary inducement to appear when required. This I would offer in the shape of pensions to commence at 50 years of age, with power in certain cases to the men to commute by anticipation their prospective pensions. I believe the effect of a pension is, in the case of the class of men we wish to attract to the ranks, very great. Dockyard workmen accept lower rates of wages, with the knowledge that they will be pensioned when disabled; and I think that every man who has served faithfully in the Army and its reserves, should have a claim to a prospective pension, with power to commute that pension in certain exceptional cases, such as the case of a man wishing to emigrate.

It may be objected that the expense of this arrangement would be so great as to debar its adoption; but that is not so. The cost of short service with pensions, as compared with long service with pensions, is very fully given in papers that I read in this Institution in 1868 and 1871. The correctness of those calculations may be easily tested, and I refer to those papers for my views on points of detail which cannot now be entered into.

No project for finding recruits can be considered complete, in which the cost has not been taken into consideration, and I entirely dissent from Captain Hime's assumption that the "flower of our population" could be conscripted into the Army at about one-third the cost of the present Army. Indeed, I doubt whether, were conscription possible, the cost man per man would be so little as we now pay.

Under existing arrangements, the cost of each volunteer, who receives neither pay nor pension is about £2 per annum, while the cost of militiamen, who serve without pension, is £6; the cost of a reserve soldier is something more, and the cost of a line soldier, including pension, was, as shown in the appendix to the Prize Essay, about £40 in 1868. (I am unable to reconcile this latter fact with Captain Hime's statement that we are now paying £100 a-year for the "dregs of the community.") The annual cost of a volunteer who had served in the ranks of his regiment, including the cost of his prospective pension, would not exceed the present annual cost of a militiaman; yet I am sure such a volunteer would be worth more than one of the militia boys who have been referred to. The annual cost of a militia soldier, who had served in a regiment, would be about double the present cost of a militiaman, and that of a regimental reserve soldier would be about three times the cost of our present militia reserve soldier, including in each case, the cost of pensions. I believe payments on this scale would attract recruits, who would afterwards join the reserve; and, taking into consideration the fact that provision for pension would be provided concurrently with their service, I do not think the cost would exceed that which we are now paying for the Army, and for pensions on the old limited service principle.

I think if the pensions were thus treated as annuities (like post office annuities), the issuing thereof could be transferred to a civil department of the Government, and there would be more chance of pensioners being engaged in suitable civil employment.

I entirely dissent from the idea that the Officers would prefer their present inactive life to one of responsible duties and command. I think it must be most irksome to Officers of regiments to be obliged to turn out for duty with the present

skeleton companies. They would be only too glad to be assigned other responsible employments, in directing the industrial employment of their men, and in managing the Reserves.

I may here say that I believe, by proper arrangement for the industrial employment of the men, the wages of the soldier might be very largely augmented, without increasing the charges in the Army Estimates.

The CHAIRMAN : I think it would be better for this meeting to understand, from Colonel Leahy, more precisely what he means in regard to pensions. He mentioned giving a pension to every man of the age of fifty. I want to know whether a man who has been two or three years in the Service and leaves the Army is, at a subsequent time, when he attains the age of fifty, to have a pension?

Colonel LEAHY : I mean that a man should be liable to serve, up to the age of fifty, in one of the classes I have enumerated, receiving, while serving, the emoluments of the corresponding service or Reserve. If he does not fulfil his engagement, he would not be entitled to his pension ; but, if at any period of his service, he wished to anticipate his pension, having fulfilled his engagement up to that time, he might commute his claims to a prospective pension.¹

Mr. CLIFFORD E. WALTON, Deputy-Assistant Commissary-General : I am one of the defeated candidates for the gold medal so deservedly carried off by Captain Hime, and I mention this fact as giving me some claim upon your attention, because it is some guarantee that I must have devoted myself to the study of the subject. You are aware that certain distinguished members of the Council most kindly volunteered to devote their time to the somewhat invidious task of selecting the successful essay, and, I think, however highly placed above our criticism they may be, it must prove a satisfaction to them to know that even the vanity of defeated essayists can concur most cordially in the justice of their award. Without, for one moment, pretending to place my own judgment on a par with that of those who have so kindly acted as our umpires, I do honestly say that, notwithstanding all the proverbial partiality of an author for his own productions, I acknowledge, with pleasure, the discrimination and justice of their decision, so far as my own essay is concerned. Still you will not think, because I am a defeated essayist, I should therefore be precluded from taking part in this discussion. I by no means think Captain Hime's essay faultless, if it is to be regarded as a final and practicable solution of the question now before us. Permit me to confine myself to the point at issue, by submitting to you the details in which, I think, the two essays that we have heard on the subject are radically and essentially faulty.

First, with regard to Major-General Sir Edward Warde's lecture. It does not appear to exhibit, in any way, either the estimated strength of the serving men or of the trained soldier reserves, or the estimated cost of that strength. However valuable, therefore, such a paper may be and must be, coming from an Officer of such standing and weight, as containing his opinions and experiences upon certain points, I must submit to you that, as a definite solution of this vexed question, it does not afford much practical aid to the legislator or to the political economist. There are one or two points in that paper on which I should like to throw the light of past history, such as the promotion and punishment of non-commissioned Officers. We have only to look back comparatively a few years to find its solution ; but these, after all, are very minor and collateral details in any grand and comprehensive scheme for obtaining men, in sufficient numbers, for the defence of this country. I submit that any scheme to be now adopted must be thoroughly comprehensive, if it is to be of any avail whatever, in view of the enormous reserves of *trained soldiers* at the disposal of each one of the other great Powers. When we limit ourselves to the discussion of such matters as a few pence more or less of pay per day, and the promotion and punishment of non-commissioned Officers, or the disposal of soldiers in Government appointments after their service, it does seem to me as if we were trying to stop a huge and alarming leak in our national ship with a wretched single cork ; and when I hear so many distinguished Officers, both in speech and print,

¹ The cost of pensions and the value of prospective interests therein, can readily be calculated from the annuity tables in the "Postal Guide."

proposing to solve the question of our very existence as a nation by such expedients as shall serve merely to stave off current desertion, or to fill the vacancies on our petty existing establishment, it seems hopeless to induce the civilian population to appreciate rightly the utter insignificance of what we are pleased to call our Army. Some of these expedients seem to me to reduce themselves to such *reductio ad absurdum* as this:—One Englishman, thoroughly trained, on his present pay, is equal to more than one foreigner, *ergo* if you pay him double, he will be equal to two foreigners; if you pay him treble, he will be equal to three foreigners, and so on, *ad infinitum*. I should imagine that the only regret of our soldiers to such a scheme, when called upon to meet 2,000,000 of Germans or Frenchmen, would be that they cannot carry these advantages into the next world with them. I would suggest to those gentlemen who advocate entire reliance on the voluntary system, that they should first sit down and carefully compile statistical statements, showing the number of trained soldiers at the disposal of each of the other great Powers, and the number of trained soldiers they feel certain of being able to give us, even if all their expensive suggestions as to increased pay, &c., were adopted; for I maintain that, if we had no deserters, and fifty applicant recruits for every vacancy on our existing establishment, we should not be one whit nearer an efficient Army as compared with other nations. Captain Hime has so very ably gone into the history of past measures, that it is needless for me to do more than say that, so far as he has gone, he has climbed the same historical ladder as myself, and arrived at the same conclusion. It is time, I think, that we hear somebody on the side of Conscription; for clearly, if we wish to remain a power in Europe, or an independent people at all, we must march with the times—we must follow the initiative already set by our neighbours, and must adopt manhood service (*i.e.*, a passage through the ranks of every youth on arrival at the age of manhood). I may here remind the objectors to conscription that, in our last European war—the Russian war—a war which was of only two years' duration, and of no comparison, in point of magnitude and numbers engaged and rapidly, with later wars—we were obliged to adopt that very conscription which they assure us that the English people would not even now tolerate, when every day even the most prejudiced student of military politics is becoming more and more reconciled to its necessity. But, although I agree with Captain Hime that we need conscription, he must permit me to observe, he has not even attempted to solve the great problem into which this great question of recruiting must resolve itself, namely, the problem of the reconciliation of the two antagonistic elements of *men* and *money*. It is all very well for a physician to prescribe to a poor patient plenty of cod-liver oil, port wine, abundance of cream, and other expensive delicacies—the prescription may be most excellent in the abstract, but if a man cannot afford to carry it out, it is of very little practical use to him. Again, Captain Hime seems to me to propose an exceedingly limited conscription at first. I believe nothing would sooner conduce to the speedy repeal of a Conscription Act than the dissatisfaction caused by such partial action at first. If we put every man in the same boat, very few will be unmanly enough to grumble; but if 10,000 or 20,000 are to be selected from 150,000, the outcry will be great.

Captain HIME: I spoke of an unlimited or universal conscription.

Mr. WALTON: Limited, in the first few years, by taking a few men by lot.

Captain HIME: It depends upon the sense of the words.

Mr. WALTON: And, with regard to the other proposals that we have had with respect to the Reserves, let me remind you that, if every youth in this country, without exception, were compelled to pass through the line on arriving at the age of manhood, we should still be four years before we should be in possession of a reserve of even so little as half-a-million of men, and the other principal European nations have two millions at this moment. The great deficiency in Captain Hime's essay is his ignoring the question of expense. I think, too, he has failed to give us an immediate Reserve—remember, gentlemen, that nations now-a-days are wrecked in *six weeks*—an immediate Reserve of trained soldiers; and by "trained soldiers" I do not mean a rabble of raw militia lads, however excellent material they may be, with arms in their hands; and I do not mean a high spirited, devoted, and patriotic, but only half-disciplined body of civilian volunteers; I mean trained

soldiers; men who have passed through the regular service, and have been thoroughly taught, and who have subsequently been compelled to keep up their knowledge and discipline by regularly recurring drills and trainings, more or less frequent in proportion to their previous regular service. I do not agree with the foreigner who said our volunteers were a "harmless joke." I do not think any institution which induces the people of this country to believe that they possess so many thousands more reliable, trained soldiers ready to take their place in the ranks than they actually do possess, can be harmless. Surely, when all the other great Powers are enabling themselves to place in the field, at a *week's* notice, from *one to two millions* of thoroughly trained soldiers (and we have heard from the last speaker that they are thoroughly trained, although young soldiers), it is too late for us to occupy our time in discussing such a miserable stop-gap as the acquisition of 10,000 or 12,000 additional recruits in a year, or the hindrance of the desertion of some 3,000 or 4,000 unwilling soldiers. We are met here to discuss, not the individual wellbeing of the soldiers now serving, however important that may be in itself, but the public requirements of our country in case of menace. I submit to you, then, that the requirement of the times is this—the acquisition of a very small, or comparatively small, but highly perfect regular force, with immense power of instant expansion, that is, with unlimited reserves of trained soldiers—and the difficulties in the way of this requirement would be, first, the financial difficulty—the money difficulty—and afterwards the political, social, and mercantile difficulty. With every admiration for Captain Hime's essay, I do submit that he has not met this requirement, and has not grappled with these difficulties, so as to afford any real aid in their solution. Even if my time would allow, it would ill become me now to inflict upon you the proposals contained in my own essay, but one point I desire to impress upon my audience—that it is absolutely necessary that we should withdraw the public mind from dwelling upon the supply of a limited number of raw recruits annually, in order to force it to concentrate itself upon the question of unlimited reserves of trained soldiers. Therein, and therein alone, appears to me to lie the whole question of an efficient or an inefficient Army, as Armies go now-a-days. It is said, the country is not ripe for manhood service; but I do urge you to perform the manifest duty of such an Institution as this, by *leading* public opinion on military and naval affairs, and not by merely following the dictates of those who would be the first to blame the leading members of this Institution if disaster should ever occur. I may have spoken plainly, but I hope not discourteously. I hope plain speaking may be encouraged in this Institution, and the speaking also of young Officers like myself, as well as of those older Officers from whom we come here to learn, so long as that speech is consistent with the speech of Officers and Gentlemen, so that we may compel outsiders to listen to the warnings of this Institution and to profit by its advice. I maintain myself that there are devices by which manhood service could be carried without delay into effect, without detriment to the mercantile or productive interest, and without any great increase to the general taxation; but, as our Army is now, it really does seem as though the old Roman proverb was daily becoming more and more applicable, sadly and prophetically applicable, to our own country, "*Quos Deus vult perdere, prius dementat.*" The main problem of the reconciliation of the two antagonistic elements of men and money has, I submit to you, not yet been solved, and, so long as that reconciliation is not effected, the problem will remain unsolved.

Major WETHERED, Paymaster, R.A. : I was not a competitor for the gold medal for two reasons; because I had not studied the subject sufficiently to feel qualified to enter the lists, and because I have not been associated sufficiently with the fighting force of the Army to speak with any authority. However, I was deeply interested in hearing the discussion on Friday, and last evening I read Captain Hime's able essay. He certainly in that essay proposes to take John Bull by the horns. It seems generally admitted that the noble animal is not prepared at present, certainly not without the red flag being waived much more closely to his vision, to undergo the yoke of military bondage, and therefore I think we should consider how far we can make better use of the existing voluntary system. I quite agree that this voluntary system has not been properly worked out. It has, in fact, not had a fair chance in any way. Our recruiting system is excessively faulty from beginning to end. When

the recruits join, we do not make the Army as popular to them as we should. We do not seek to make them as contented as we ought to do. We subject them to a great deal that might be avoided. Our non-commissioned staff is nothing like what it should be. There is nothing to induce emulation amongst the men in the Army to attain to that rank. They are not at all the class of men we should have in any way. Sir Lintorn Simmons has given us very interesting details, and has evinced the labour and trouble he must have taken to arrive at these conclusions. As regards the cost that he has shown the country is put to, by enlisting lads from sixteen or seventeen up to twenty-one, he has omitted one or two points which rather strengthen his case, and show that they cost the country more than he laid down. For instance, if we take a soldier at sixteen, and he is not physically fit as a man for the duties required of him, we are not only paying him up to the age of twenty-one, but, taking that five years' service from his first term of twelve years, or twenty-one years in all, we lose five years efficient service; so that, instead of getting twenty-one years' service from a muscular man, before we allow him his pension, we only get seventeen years, and in the natural order of life he would draw his pension five years longer. It would appear to be a wise economy to pay men of twenty-one years or upwards, on enlistment, a higher rate of pay, and exact less service towards pension. Mr. Holms touched one very important point; that is, to relax the ordinary *régime* of the barrack-room. I think it would be a very great improvement. We treat soldiers very much like children. Every Officer knows how unpleasant it is if his superior is constantly harassing him about some little matter which does not interfere with the efficiency of the Service; and that is very much increased in the case of the men. If we knew the aggravation to which these men are sometimes subjected from an inferior class of non-commissioned Officers, we should have an idea to some extent why soldiers do not like the Army when they join it. Then, again, if soldiers in the "piping times of peace," have very little to do, why should not we give them the benefit of that ease? During their leisure hours could we not provide some means whereby they might learn some trade or handicraft, or some remunerative employment? The country would gain by it in the end, and the men would be turned out respectable members of society. Then, in the barrack-room, we might have many trifling comforts, but still great comforts to the men. For instance, why should not the men have a seat to sit down on instead of a form? A chair or a stool would be a great comfort to a man, for he cannot drag a form all over the place. Then a man has no place to put any of his personal property. Why should not every man have a small locker or shelf, where he could leave his property in security. A question was raised about not getting recruits, because we go into the labour market at a disadvantage. Though we do not bid for the soldier the same price that we are paying the labourer, yet the soldier has many advantages in the future which, to a certain extent, counterbalance the small amount of pay he receives on enlistment. I am quite certain that no man who is in any employment, and receiving a stated amount of pay, would think of entering the Army at a less rate of pay. The men who enter the service are generally those who are dissatisfied or discontented with their position in civil life. No doubt, with many of them "their character was so bad they could get no work, and so enlisted." Now, whatever may be the motive which induces men to enlist, I think, when we catch them, it is an advantage that we should take them off the country, and it is our interest to make the Army as pleasant as we can to them in every way, and to make them content with it. Here it is that our faulty enlistment at once breaks down. We send out recruiting parties, and their object is to cajole every man they can into enlistment, for the sake of the reward we give them for bringing these men in. A soldier comes—he is sworn in, and bound for a certain number of years. He joins his regiment or depot, and finds things are not exactly what he thought they would be. He goes for his pay, and expects to get his shilling; but finds that, instead of getting a shilling a-day, as he expects, he does not receive sixpence. The recruit is liable to a great many stoppages out of his pay, so that it is reduced from a shilling perhaps to three pence. Then, when come to his rations—he does not get a sufficient quantity of meat. A man nominally gets three quarters of a pound of meat, but bone, and inferior cooking, reduces it 50 or 70 per cent.

Sir HARRY VERNEY : I ought hardly to intrude myself upon this meeting, when there are many Officers who have more and far more recent experience than myself upon the matter. I had the recruiting of the Grenadier Guards many years ago for six months, and I made it a great favour to admit a man into the regiment ; therefore I had no difficulty at all in obtaining recruits. I think there are many improvements that might be recommended from this Institution to the Government, which would make recruiting for the Army more popular, and induce men of all classes to desire to enter the Service. I do not agree that there would be no advantage at all in giving little civilian offices, which fall to the disposal of the Government, to old soldiers.

Mr. WALTON : I did not say that ; I only said it did not affect the question very much of a large reserve.

Sir HARRY VERNEY : I look upon it that it is the duty of the Government, when men have served in the Army and the Navy with credit to themselves, and left their service with a high character, always to give them such offices as are in their power to fill, as well as men who have not served the country. For instance, I was lately at Kew Gardens, where I used to see some old soldiers of the Rifle Brigade, but to my great regret I find that in place of them, the Metropolitan Police are now substituted. In Hyde Park, Metropolitan Police may be preferable, but in places like Kew Gardens I should think old soldiers as suitable. It has always appeared to me that we may introduce into the Army that system which in the Navy has become so very satisfactory, I mean the system of educating boys for the profession.

We all know that sailors who come from the "Britannia" have been among the very best sailors in our ships. Why should we not have an establishment in the New Forest, or Cannock Chase, or Dartmoor, for educating our young soldiers ? I consider that every man who has been educated at the expense of the State, ought cheerfully to serve the State in the Navy or Army Reserve. I am in favour of such compulsion with regard to the militia, but of the voluntary system as to the Army, every lad who has been brought up either in a reformatory or in a workhouse ought at once to be drafted into the militia. As to another point, I may say, when recruiting, I never thought of refusing a man because he had a bad character with the parish constable, or even with the gamekeeper, though I never would admit a man who had been convicted of felony, or any disgraceful offence, or who had such a character that he would be injurious to the regiment. Many of those men who had a bad character from the constables, though nothing worse had ever been found against them, when enlisted, turned out after a time to be among our very best soldiers.

Brigadier-General Sir JOHN ADYE, R.A. : I am desirous of taking a small part in the present discussion, although aware that time will only admit of a short outline of my views. The subject under consideration is "the best mode of forming reserves for the British Army." Before putting forward my proposals, let me shortly review the old conditions under which our soldiers served. Formerly the men were enlisted for unlimited service, and remained until incapacitated by age, wounds, or failure of health. In 1847 the system was introduced, which was, practically, one of 21 years' service with a life pension. It had many merits. The men were well trained, well known to their Officers, and for the most part in the prime of life ; such was our Army when the Crimean war occurred. On the Queen's birthday of 1854 20,000 English soldiers marched past the Sultan at Constantinople on their way to the Crimea, men, in point of *physique*, discipline, and training, almost unrivalled. The battles which ensued proved their worth. They stormed the heights of Alma, exciting the highest admiration at their courage, and we must not forget that the distinguished General in the chair (Sir William Codrington), was one of the great leaders on that occasion. Again, at Inkerman, though faint, weary, and hungry, they stood for hours and held their position against great odds. But there is another side to the picture. The Army, though excellent in itself, had no Reserves. During the earlier periods of the campaign it began to diminish at the rate of 3,000 men a month. The Committee of the House of Commons, on the state of the Army before Sebastopol, say :—"At the date of the expedition to the East, no reserve was provided at home, adequate to the undertaking." Mr. Sidney Herbert states in his

memorandum of the 27th November—"The Army in the East has been created by discounting the future; every regiment at home, or within reach, and not forming part of the Army, has been robbed to complete it. The depôts of battalions under Lord Raglan have been similarly treated. Again, the men sent out to reinforce the Army were recruits, who had not yet become fit for foreign service, and the depôts at home were too weak to feed the companies abroad. The order to attack Sebastopol was sent to Lord Raglan on the 29th June. The formation of a reserve at Malta was not determined upon until early in November. It will be seen from the correspondence between Lord John Russell and Lord Aberdeen, that Lord Raglan had reported that he wished he had been able to place in the position of Balaklava, on the 26th of October, a more considerable force; and also that, on the 5th November, the heights of Inkermann were defended by no more than 8,000 British infantry." "When the Duke of Newcastle acquainted Lord Raglan that he had 2,000 recruits to send him, he replied that those last sent were so young and unformed, that they fell victims to disease, and were swept away like flies; he preferred to wait." These words of Lord Raglan show how quickly the Army had fallen into great difficulties from want of reserves, and for months it dwindled away in front of the enemy, and England in great grief had no adequate means of reinforcing its shattered ranks. When the war terminated we had actually buried 21,000 men. Such is an Army of old soldiers and no reserves. It can fight a few battles, but is not fit for a prolonged campaign. Surely it is apparent that we must devise a system which will enable us to maintain our strength in a lengthened war. Every nation has studied this question, and has decided on a principle of short service and reserves. The gallant Officer, Captain Hime, who has gained the gold medal of the Institution for his essay on this subject, attempts to prove that rigid conscription is the only solution. No doubt a first rate Army can thus be obtained; but is the country aware of, and prepared for, the inevitable sacrifices of such a plan? Are the merchants with their own sons, foremen, managers, mechanics, and workmen, ready to serve three years, to be drilled incessantly, and be then sent into reserve? Are they prepared to place military requirements first and commercial last? We should have a magnificent Army, the country would be safe, and the estimates would rapidly diminish, because men, taken regardless of market-value and without pensions, would cause a great saving. But look at the other side, and do not forget that the Estimates would not show the real cost of the Army, because trade and commerce would be paralyzed, especially in time of war. The Continental Powers feel compelled to adopt this plan, because they are in close proximity to other nations equally powerful, and the frontier between them is a mere line drawn on the map. But even with them the system is becoming perfectly unbearable; and, in some cases, thousands are leaving their country to escape it. Our circumstances are different, and I have not yet observed any symptoms leading me to believe that the people are prepared to adopt conscription. What, then, it may be asked is the solution of our difficulty? Two great measures have been recently introduced: the one localization, the other, the partial introduction of short service, which seem to give great promise of success. As regards the first, our regiments have hitherto had county titles, but no county ties. They have had small moveable depôts and indiscriminate recruiting. For years past, military men have advocated the principle of localization, and at length the system is about to be tried. The depôts are being permanently fixed in their own districts, county associations will be formed, which will stimulate recruiting and popularize the Army, and which will ultimately lead to a fusion of the militia and the line. I hope ere long to see the militia and the line battalions blended into one, the former for home and latter for foreign service, the Officers and non-commissioned Officers becoming interchangeable. Such are the hopes of successful localization. The other change, that of short service, is, if possible still more important. It is evident that the duties consequent on our Indian and Colonial possessions do not admit of an absolute system of short service—but we may let the two run concurrently—that is, maintain a proportion of men for short service and reserve, and the other with long service and pensions as of old. Surely these great measures which are now being introduced, are worthy of a trial. It is said, however, that our recruits are falling off in every respect, and that men will not enlist for short service. My own experience does not bear out this view.

Having commanded the Brigade Dépôt of the Artillery for some years with two or three thousand recruits under my command annually, I found them to be of the same class as had always enlisted, and I could desire no better. Let me, however, quote the opinion of the Inspectors-General of Recruiting. General Edwards, writing in January, 1873, after stating that the number of recruits in the past five years amounted to 92,456, adds—"It will be seen that the number of recruits fully equalled the demand, and that the inducements to enter the service during the last five years have been sufficient." Again, he says—"The autumn manoeuvres of 1871 and 1872 have elicited the fact that the *physique* of the Royal Artillery and Cavalry have been such as to excite unqualified approbation; and, by a careful observer it has been remarked, that the nation may be assured that the Infantry are such as could be desired, and have maintained their long-established character of efficiency." Again, General Taylor, the Inspector-General, in January, 1874, writes—"Although there is thus shown a slight diminution in the number of recruits raised during the past year, yet that number has been sufficient to keep up the Army at large to its establishment as authorised by Parliament, and there is little doubt but that a larger number might have been obtained, had the requirements of the service called for an increased supply; for, in many sub-districts, recruiting for some portion of the year was almost entirely closed." Again—"The quality of the recruits raised during the year may be considered as satisfactory. At all the chief military stations throughout the kingdom, the principal medical officers have made reports monthly on the subject, and on all occasions have expressed themselves fully satisfied with the *physique* and general appearance of the men who have joined the several corps." He concludes his report as follows:—"Not only is the recruiting for the British Army perfectly voluntary, but the standard at which this number has been raised, viz., five feet five inches for infantry, is considerably higher than that of any other Army in Europe, and that by a slight reduction of it a considerably increased number of recruits might easily be raised." In January, 1875, General Taylor made another report, in which he again speaks favourably of the recruits, and says that nearly 21,000 men enlisted in 1874, of whom upwards of 12,000 were for short service. Therefore, both as to quality and numbers the new system appears to give promise of success, though of course it requires time to be matured and developed. There are some, however, who will say that the reports I have quoted are merely official, and, indeed, an honorable gentleman, a member of the House of Commons, Mr. Holms, has recently published a grotesque caricature of the British Army, in which he asserts that the Army administrators are blind, feeble, and wrapped up in red tape, and that these reports, are published to mislead the country. Sir, I value them because they are official, and because they are written by men of high rank, honour, and long experience in war, men placed in most responsible positions. I rely implicitly on their statements, and am glad to find they speak so hopefully of the future of the Army, and I confidently quote their facts against the theories of ignorant and irresponsible panic-mongers. Time prevents my saying much more. Localization and the partial introduction of short service afford the best prospects of our maintaining an efficient Army in the future with an adequate reserve. We must, however, improve the militia and blend them with the line. I often hear disparaging remarks made respecting the British Army. It seems a fashion now to decry our forces, and to belaud the armies of foreign powers—but as an old soldier I retain my confidence in our troops, which have never yet failed us. Our men are far better paid, clothed, fed, and cared for than of old; our non-commissioned Officers in point of intelligence and education are superior to those of my young days. Whilst our Officers retain the high spirit which has always distinguished them; they are far better taught, professionally, than formerly, and are full of zeal. The Army, it must be remembered, serves and fights all over the world. It has a far wider experience than any other nation, and it truly represents the genius and enterprise of the British race. It has always fought well of old, and is ready to fight again. We have, in round numbers, 100,000 soldiers and 366 guns manned and horsed in the United Kingdom at the present moment, exclusive of militia and volunteers, a number far larger than we have usually maintained in time of peace; and, in my opinion, the country is better prepared for war now than at any previous period within my recollection.

Colonel LUMLEY GRAHAM: I hope you will not think it indecorous in me if I begin what I have to say by something approaching a joke. One of the speakers said something which put the idea into my head. We seem here to be like a set of doctors called in round the bed of a very sick man, that sick man being the British Army; and, as it is proverbial that all doctors disagree, we naturally do disagree on every point except one, viz., that the sick man is very sick indeed. Not only that, but that it will require a very great and long course of medicine and a very expensive outlay to save his life even, and to set him on his legs at all in an efficient state. There was one exception to that opinion which I was very glad to hear, because it came from an Officer of great authority and high standing, and I hope the more cheerful view of the patient's state may be the correct one; but I must say, as far as my opinion goes, I join with the majority in thinking that the sick man is very sick indeed.

We are here to discuss the very able essay of Captain Hime. He took great pains to show that the sick man not only was sick now, but had been sick from the very commencement, from his youth upwards; in fact, there was not a single time in which he was not a very poor, rickety creature, and that he was always in difficulties. The wonder is that such a rickety creature has been able to do such good hard service in all parts of the world. I think he must have an uncommonly good constitution to go through all he has gone through, being such a poor creature. But, however, this is too serious a subject to joke upon. I myself am one of those who think the present state of things is a very unsatisfactory one; that it is useless to attempt to combine short service with the voluntary system, principally for this reason, that you cannot get recruits enough under the short service system, and moreover that we have much too young an Army, that is to say, we have much too large a proportion of young soldiers in the Army, and if we were put against one of the great Continental Powers, we should be at a great disadvantage. With the voluntary system of course we all know we must take men when we can get them; we take lads, in fact boys. Those boys, if they had time, would train up into very able-bodied soldiers, and into better men than if they had remained civilians; but if we have a war they will not have time, and we shall have to take the field with much too large a proportion of young men. Therefore I perfectly agree with Captain Hime, that short service and voluntary service cannot be combined. I do not agree with him in thinking the voluntary service must be superseded by conscription. I think there is no doubt the whole question is one of money; you must pay in one way or the other. I think we are all pretty well agreed as to that—you must either pay directly, by raising the advantages or pay of the soldier, or you must pay indirectly (and I believe it would be a far greater amount in the long run), by having universal conscription. I do not for a moment believe the system Captain Hime has recommended would work, that is to say, a home Army of one year men. We may train men to be soldiers in one year, that is, we may make them march past, we may make them go through their drill creditably, and even shoot fairly, but as for making them soldiers in one year, I deny that we can do so, even with infantry, and I ask any artillery or cavalry Officer or engineer Officer if he thinks either cavalymen, artillery, or engineers can be made in one year. According to Captain Hime's proposals, the home Army is to consist of one year men. Supposing war is declared, we have to take the field, perhaps on the continent, with an Army composed entirely of one year men, supplemented by a reserve of men who have also only served one year with the colours, and have been two or three or four years in civil life afterwards. Would an Army of that sort meet the Army of Prussia? Colonel Leahy supported Captain Hime in thinking one year was sufficient to train a soldier.

Colonel LEAHY: I said to teach a soldier his duty; and that one or two subsequent summers with manœuvres would complete his training.

Colonel LUMLEY GRAHAM: As I understood Colonel Leahy, he thought one year was sufficient to make him a soldier, and he referred to cases of training he gave to men at Chatham; but I think the men he alluded to were either Royal Engineers, a better educated class of men than the line soldiers, and therefore who could be trained in quicker time; or they were men in the line who had been already two or three years in the Army. Then he alluded to the

Prussian Army. It is quite true a large proportion of the Prussian infantry are not two years with the colours; but then the non-commissioned Officers are almost all re-engaged men. Captain Hime's proposal does not appear to allow for re-engagements in any way, therefore we should have, not only one year's soldiers rank and file, but one year non-commissioned Officers, and I do not think that would work. I merely wish to make a suggestion which has occurred to me, as a way of overcoming the difficulty. I still wish to preserve the voluntary system with comparatively long service; at the same time I think it is better to utilize what we have, than to pull down everything and build up something else: therefore, I should like to preserve our present reserve forces, the militia and volunteers, because I believe they are capable of being made very good use of, if organized in the proper way. I should propose that the militia should be the foundation of the whole military system, and that the militia alone should be raised by conscription. By conscription I mean, as Captain Hime says, without dotation and without substitutes—a conscription applying to the whole people with, of course, the exemptions allowed in all countries where conscription is the rule, and with this addition, that really efficient volunteers should be exempt, a high standard of efficiency being fixed, thus making the volunteers take the place with regard to the militia of the English Army, that the one year volunteers in Germany do to the whole force. Now, the number of youths attaining the age of eighteen annually in the United Kingdom, is nearly 300,000, a much larger number than the quota which would be required for the militia. You could, therefore, afford to fix a high standard of efficiency for the militia conscript. As I should look to the militia as the force specially for home defence in case of war, I would have the regiments at all times organised in brigades and divisions. I look also to the militia, as the source from which the greater part of the Army recruits would be drawn; and in order to provide for volunteers to the Army without impairing the efficiency of the militia regiments, I would enrol annually a proportionably larger number of conscripts than would be required to keep them up to the proper strength. I think we could recruit the line very largely from the militia in that way, without impairing its efficiency, and we should get a superior class of recruit, because we should be certain of getting men whose characters we know something about; we would not take men of bad character, or who were physically unfit. Let the line soldiers serve ten years, then I would say, "You have your free discharge," except good non-commissioned Officers, retain them, by all means. I would allow good non-commissioned Officers, and perhaps a few picked men who might be useful—musicians, and so forth—to re-engage for a further term of five or ten years. I would say to the rest, "You may join the Reserve for ten years." The temptation to do so would be, at the end of the twenty years' full service in the Army and Reserve, I would give them a pension. To those re-engaged soldiers who served their whole twenty years with the colours, I would give a still larger pension—let them retire on full pay. I would give the Reserve man, retired after the twenty years' combined service, a reduced pension. What I look to is the prospective advantage held out to the soldier. That is my idea of it, very briefly. And then, again, I would retire some of the old soldiers, men who have passed through this twenty years' service, into the militia, for training purposes. I have not time to explain my plan fully now, but I may follow the example of other speakers and say, I am one of the unfortunate competitors. I should think it would be cowardly not to say so after Sir John Adye has said it; otherwise I should have concealed my defeat. But since I wrote my own essay, I have read an essay by Captain Trench, which I prefer to my own, and it appears to me to be one of the best solutions of the subject I have met yet, and I recommend it to your notice. Captain Trench holds out, in a different form, prospective advantages as a temptation to men to enlist, and I think, perhaps, in a better form than the way I have put it. He proposes that the pay of the soldier should be raised by sixpence a-day, and that this extra pay should be kept in hand and paid him at the end of his service. That is where I think we may find a solution to this great difficulty; it is in comparatively long voluntary service with prospective advantages for the Army, and in conscription for the militia.

Captain LUARD, R.E.: Sir W. Codrington and Gentlemen,—I must crave your

indulgence, for I am in a very exceptional position. I am *not* one of the sixty-eight or seventy-eight disappointed essayists, and shall therefore be at greater liberty perhaps to criticise these essays than those gentlemen who have competed for the gold medal. I am sorry to see Sir Edward Warde has just left the room, as I proposed to make one or two remarks on his paper.

Assuming that voluntary enlistment will have to be the case for some time to come, I should have spoken up very strongly in favour of regimental enlistment. I am quite convinced it would facilitate the accession of recruits very much indeed if men were enlisted especially for regiments instead of for general service; and I feel sure that the contrary system has militated very much indeed against our obtaining recruits. I do not exactly understand why short service should have entirely disturbed or destroyed *esprit de corps*. I was not aware it was the case in the German Army, where they *have* short service; and I am sure it did not display itself in the last great war. Sir Edward Warde has said, that voluntary enlistment is the great glory of this country. I cannot quite see that; it has appeared to me to have become an absolute failure. It never has been maintained (as Captain Hime has most clearly shown) in times of pressure, except by means of bribery in the shape of large bounties; therefore I do not think it is a great glory to us. The formation of reserves is a portion of the subject for which this gold medal was proposed to be given, and it is a very important one. Sir Edward Warde's scheme would appear to me to be an extremely costly one, and I am very sorry he did not show us in some way what it would have cost. He proposed that every man should serve three years in the militia after having served a certain period in the line; that whatever length of service he takes with the colours, whether he re-engages or not, he is still to serve three years subsequently with the militia. I wanted to know what pay Sir Edward Warde proposed to give them, because if they were to get full-pay, no doubt you could always lay your hand on your men when wanted, but when they were called out for actual service they would receive no greater pay than when called out as militia are now, for only a month or so in the year. But on the other hand, if they are only to get the sixpence a-day of pension that has been suggested, I do not think it would make any practical difference from what is now the case: you now give a Reserve man fourpence a-day, and you may whistle for him when you want him. I am rather sceptical about the existence of Reserves at present. Captain Hime's essay is a most admirable historical sketch, but I am afraid it ends there. I cannot see that this essay (and not being a disappointed essayist I may speak with perfect freedom on the subject) is much more than a very crude scheme indeed. As Colonel Lumley Graham has pointed out, there are 100,000 men proposed to be trained for one year, and then they are to be drafted into a Reserve, where they serve four years, because, in the tabular statement at the end of his essay, Captain Hime has shown that men are to be the first year with the colours, the second, third, fourth, and fifth years in Reserve, and then they disappear.

Captain HIME: That has only been suggested.

Captain LUARD: It appears to me that you would have 100,000 recruits and 400,000 men in the Reserve, but you would have no fighting army whatever. Where is your Army? Do you suppose if you took 100,000 recruits into the field they would last any great length of time? Do you suppose, Gentlemen, that any of you would be successful if you kept a large stud of racehorses, and put them into the ploughs and carts, and so on, until they were about four years old, and then put them into training at a considerable expense; trained them say for a few months, and then instead of running them, sent them out to grass again; and then, all of a sudden, when they are five or six years old, start them to run against well-trained horses!—what result would you expect? A man would be considered a fool to do such a thing! If we know then how to manage our racehorses properly, surely we ought to be able to understand the powers of men. The suggestions of Captain Hime are condensed into a page and a half at the end of his essay. I believe the essayists were asked to say *how* they would provide recruits and reserves, and that is the pith of the matter, which has apparently been omitted.

But I cannot help thinking the question has never been presented to the country in a proper light. I do not myself believe that it is the function of the *Army* to produce its own recruits. I believe that this is a *civil* duty. This nation I believe

is at present in a most peculiar and most critical state. It has arrived at an unbounded pitch of wealth, utterly unexampled in the history of the world, and I believe that is a most dangerous condition. If you look into the history of ancient nations, of Assyria, Persia, Rome, and, last of all, Spain, you will see that wealth has been the main cause of their ruin. We have hatched this gigantic egg, wealth, and what has it produced to us? It has produced *moral blindness*. The result of this moral blindness shows itself in various ways. We fail to recognise that we should insure our national property properly and to a fair extent; we also by reason of our moral blindness have become utterly oblivious to what is called patriotism: we do not now fully recognise what patriotism means. I am quite sure it never will be sufficient in the future for this country to vote money only. Some call money the "sinews" of war; but what, I ask you, are sinews without flesh and blood? They must not only vote money, but they must find men—men such as will be fit to cope with the armies of foreign nations. The only way to do that is by conscription, or a general liability to military service. We are not here to air our own dogmas; we are called here and invited to criticise and to discuss these able papers prepared by Sir Edward Warde and Captain Hime, and therefore I do not propose to air any dogmas of my own, or to show you how that conscription should be carried into effect.

The CHAIRMAN: As there are many Officers and gentlemen still wishing to speak, we must again adjourn our discussion till to-morrow; but as Captain Hime will not then be able to be present, I think it only right that we should give him an opportunity of replying to the observations made upon his essay.

Captain HIME: I rise under circumstances of very great difficulty indeed. I think I may describe my position here as that of a kind of military Ishmael; I find everybody is very angry with me, everybody has shot a dart at me, every morning-paper has struck against me, for writing what I believe to be the truth. Happily, however, most of those arrows have gone over my head; they have not been directed against me, but at some terrific chimera, some hideous shadow which stands either beyond me, or on one side or the other. With very few exceptions, indeed, every critic whom I have heard speak here, assumed at once, and most wrongly, that I propose to introduce conscription into the English Army at once. As I have already explained, I do not propose conscription; I say what I firmly believe, that conscription is inevitable, though it may not come to-day or to-morrow, or in ten, or even twenty years. I hear the torrent behind me, though I do not know how far it is off, and as I believe it is surely coming, I hold it to be common prudence to embank the house.

Lieutenant Champion said, my idea of conscription was a prophecy. If so I am Saul among the prophets, for there is not a single speaker in this room who has not prophesied freely and frequently.

Colonel Cox, of the Royal Engineers, at once assumes that I propose conscription. I do not propose conscription, nor do I assume it will come on us at once. I say it is inevitable; I propose it should be universal when it comes; and I have gone so far as to venture to point out the steps we should take with the Army until conscription arrives. As for these steps, I see no better means of carrying on the Army until conscription arrives, than by combining the schemes of Sir Edward Warde and of Sir Lintorn Simmons. Sir Lintorn Simmons wishes us to get better men, older men and stronger men, and Sir Edward Warde wishes us to introduce long service with pension. These are questions, however, I cannot enter upon. It is for this meeting to settle the system under which we should carry on the Army until conscription which is inevitable, becomes necessary. Colonel Cox proposed a number of schemes; but they all amounted simply to an increase of the estimates; in other words, to precipitate the period at which conscription must arrive.

Colonel Leahy quotes Mr. Holms to prove that Parliament would not at present hear of conscription. I feel certain that Parliament would not, because Parliament must follow the country, and I believe the country would not hear of conscription at present. Almost all the morning newspapers have criticised my essay, and one and all combine to say the country will not at present accept conscription. In that I fully agree.

Mr. Walton says the problem of the reconciliation of the two antagonistic ele-

ments of men and money has not been solved in my essay. My answer is, that it was impossible in an essay limited to thirty-two pages, to enter into many of the points connected with the gigantic question of recruiting. I could not do so with any chance of success. Mr. Walton further says that with my system of conscription, we should only have half a million of men in four years, while foreign nations have two millions. The object of my conscript army is not that of offence; it would be a purely defensive army. Every one knows that owing to our insular position, our first line of defence is our glorious Navy. We have scarcely ever been able to carry on a continental war with a large army. Our Army must be chiefly a defensive one, and it was merely with a view to form a good defensive army that I made the propositions contained in my essay.

Sir John Adye alluded to the conscriptions in France and Germany, and then concluded that England would not accept conscription. The logical conclusion to be drawn from General Adye's remarks on conscription is, not that it is unsuitable to this country, but that it would be unsuitable if carried out on the continental models. Let the Prussians and the French object to their conscription. The conscription I propose is neither Prussian nor French; it is purely English, and it is a matter of opinion whether it would work well or ill.

Colonel Lumley Graham referred to our past victories, and said it was very odd, if this poor invalid had always been ailing and was so bad as I have made him out, he should have gained the glorious victories he has done. If our victories are pointed at on the one hand, I point to our national debt on the other hand. That will explain the enormous sacrifice we have had to make in money, to enable this cripple to keep upon his legs. He again pointed out that in case of war the men I should send out under my system would be recruits. Granting, to some extent, and I cannot grant beyond a certain extent, that this is the fact, my reinforcements would, at all events be as good as those we sent to the Crimea. Sir John Burgoyne described those re-inforcements as "a vast number of recruits," and gave it as his opinion that if the reinforcements were to be of this character he would prefer to have a handful of real men rather than this mass of immature boys.

And now, Gentlemen, having briefly mentioned the few arrows which I consider have pierced me to a certain depth, I must conclude. I consider that owing to the fact that nearly every one has taken for granted that I propose conscription at once, my system remains almost untouched. It may have been pointed out that a brick is rotten here and there; that the fire-place in one room smokes; and that in another some paltry matter of detail needs alteration; but the edifice stands there still, and I do not think anybody has very seriously damaged the foundations. My facts have never been called in question; my arguments are undisputed; and my position, therefore, is this: I have proved that the three angles of a triangle are equal to two right angles, and you cry out—"The people of England will not hear of it. They do not wish to believe that the three angles of a triangle are equal to two right angles, and it is very wrong of you to insist upon proving it." Under these circumstances I shall conclude my remarks, as I conclude my essay:—"Conscription may be unwelcome to the Officers of the Army, it may be irksome to the poor, and it may be hateful to the rich; but conscription is inevitable, because it is a logical and necessary consequence of the industrial progress of modern Europe."

THE CHAIRMAN: It is fair to say with regard to Captain Hime's remarks about conscription, that the heading of his essay has naturally given rise to the idea that he certainly was in favour of conscription, because it is headed in this way, "Universal Conscription, the only answer to the Recruiting Question." I think you must be aware that that was the reason everyone has thought you were in favour of conscription?

Captain HIME: So I am, in one sense of the word.

Lord ELCHO: I am sorry that Captain Hime will not be present to-morrow, as I shall have to make special allusion to one paragraph in his essay, and I would rather do so in his presence than in his absence.

Adjourned to Tuesday, April 13th.

Tuesday, April 13, 1875.

(General Sir WILLIAM J. CODRINGTON, G.C.B., in the Chair.)

ADJOURNED DISCUSSION ON RECRUITING.¹

Captain OWEN, R.A.: I must commence by apologising for any shortcomings you may find in my remarks, for I was not one of the competitors for that medal which Captain Hime carried off so successfully by his able essay? still I have long studied the subject, and it does not seem to me that the solution offered to us in Captain Hime's essay is a successful one. Captain Hime is of opinion that universal conscription looms in the distant future as the inevitable fate of this nation. He hears in the distance the awful tread of this monster—more fell than the chimera of old. Sir Edward Warde, who delivered a lecture on the same topic in this Institution, offered us, on the other hand, quite a different scheme; but that, too, seems to be an incomplete scheme, rather a patchwork scheme, in which a good many details of minor importance are discussed. Universal conscription, I believe, Great Britain is not at present prepared, nor will she ever be prepared to take as a burden upon her shoulders. Now is the time to prepare herself in order to prevent that necessity. While the sky is clear and the day is bright, let her prepare herself for the storm which must inevitably come, by establishing an Army with sufficient Reserves to guard these islands and preserve her empire. Such reserves, I think, she can establish under our present system by carrying out the law as now existing in this land, that is, by enforcing the ballot for the militia. Of the militiaman we unfortunately hear but little, save a hackneyed line from Dryden, and a very sorry joke now and then as to his ability. Colonel Lumley Graham appears to me to have struck the right key, when talking of this constitutional force. We have had it repeated *ad nauseum* that, as at present constituted and officered, and so on, this militia is not a force which we could put in line. This may be so, but is it not capable of improvement? I think it is. So also are our volunteers. At present, I must confess, they appear to be worse than useless. By their numbers they impose upon the nation, while they have little more cohesion than a rope of sand, and are utterly destitute of military discipline. Captain Hime has put much valuable statistical information before us, and from it has endeavoured to prove that voluntary enlistment for our Army is and always has been a failure. But how does he prove it? Merely by the cost. He points to our National Debt as proof positive that this system has failed. On the other hand, can we not point to the wonderful progress of this nation, its wonderful development; would that progress or development have taken place had we laboured under the iron grip of conscription? I think not. As to comparing the cost of the regular army under this system with the cost of the continental armies under conscription, it seems to me quite impossible. Who can reckon up the awful loss to the nation of taking away her workers and converting them into soldiers—taking her working bees, instead of taking, as we have done, the drones who would never work, and making them into useful soldiers. Before discussing how we should obtain our forces, we should know, in the first place, what are the forces we require? It appears to be generally agreed upon, that we require a sufficient force, in comparison with those of the Continental Powers, to be of some importance in an European crisis; that is, a force certainly of not less than 60,000 or 100,000 men, well equipped and ready for war at a moment's notice, backed by 200,000 trained soldiers as reserves, in order to uphold our dignity, and to preserve this island in its integrity against invasion. For obtaining this Army and these Reserves, we have had laid before us, here and

elsewhere, three schemes: one, that of Captain Hime's, in which conscription appears to be the inevitable end; another, that in which, with an army recruited by short service, we have reserves filled in from that army entirely; and the third, in which we have a regular army of long service, a Colonial and Indian Service, and reserves of short service, quite distinct from this Army, but affiliated to it, and supplied by it with trained Officers and non-commissioned Officers, and a certain proportion of men to form as it were a backbone. With regard to these three sources, no doubt the first is clear, logical, and simple; but I am certain that this nation is not prepared to bear such a terrible burden; nor is there, to my mind, any necessity for her doing so. The second course, that we have a standing Army recruited by short service, and reserves formed therefrom, has also its advantages, and to the professional soldier many more advantages than the third one. The third is the one, however, which I wish to advocate, because it seems to me the only one which we can carry out to the satisfaction of the nation. I am not alone in this opinion. Colonel Lumley Graham has already expressed his views upon the subject; and there is an able pamphlet, written by an Officer whose absence we must all regret, in which similar views are advocated. I allude to "Army Reforms and Militia Reserves," by Colonel Anson. A former speaker implored us to raise the discussion out of the sphere of argument upon petty details, if we wished to lead public opinion out of doors, without which being gained, the object we have been talking about cannot be carried out, that is to say, the formation of proper reserves. I will try to act on this advice, Sir, and lay before you my proposals in a few words. Let any standing Army be recruited voluntarily, short and long service running *pari passu*; let discipline be stringent; let deserters be dealt with with an unsparing hand. Above all, let us have pensions; come what may, we must have pensions if we want to have a satisfactory standing Army. It is the enfeebled, mutilated soldier, sickened by foreign service or mutilated by accident or war, wandering destitute through his native village, that prevents our getting recruits; let each veteran have a proper pension, and then in some cozy chimney corner or the tap-room of the village inn, he will fight his battles o'er again, and attract to us many a promising recruit. It is, too, of much importance that the pay of our non-commissioned Officers should be raised, otherwise I fear they will deteriorate still more. Then comes the question, how are we to form our Reserves? By balloting for the militia. Let us utilize those *dépôt* centres, by establishing which, Lord Cardwell, first of War Ministers, attempted an extensive organization, and affiliate more closely to our regulars the reserves of militia, constituted as follows: Call out by ballot annually 50,000 militiamen; let there be no substitutes; let them be called out by local committees in the various districts, each district corresponding to a *dépôt* centre, where the battalion for the line of that district would furnish Officers and non-commissioned Officers for the militia reserves. Let them be called out between the ages of 18 or 19, or 20 or 21; let them serve with the colours continuously for two years, and then in the Reserves for three years. While with the colours, they are only liable for home service, save in case of war, this service to be as far as possible local, but their military discipline would be as strict as possible, and all advantages that could be given, should be accorded to young men passing through universities and colleges, on the one year, Prussian, or some like system. This would supply us with a reserve of really trained soldiers, rather more than the 200,000 men we require, contingencies excepted. On mobilization, the militia under training in the militia reserves, would constitute extra battalions for the regiments of that *dépôt* centre. The battalions under training would be officered by the Officers of the regiment at the *dépôts*, and the reserve militia battalions would be officered by half-pay and retired Officers of the Line, and by county Officers, as at present, who had passed through proper training, of course. Such are the broad outlines of the scheme which I would propose. But whatever scheme we adopt, we must not blind ourselves to the fact that two things are absolutely necessary: one is organization—a thorough and complete organization; and the second is expenditure of money. Whatever scheme we adopt, we cannot escape that. If this country is prepared to keep a sufficient Army and reliable Reserves, upon whatever footing that Army may be recruited or the Reserves formed, she must spend more money than she does at present. Of course, we all hope for

those halcyon days when arbitration may put an end to brutal war, but at present it is but too plain that the old rule holds good :—

“ That good old rule, that simple plan,
That he may take who has the power;
That he may keep who can.”

Colonel the Hon. PERCY R. BASIL FIELDING, C.B., Coldstream Guards: Sir William, Ladies and Gentlemen,—I trust the fact of my having for some years commanded a regiment of Guards, may be deemed sufficient excuse for my venturing to offer a few remarks in this discussion, for the sole reason that in the Guards we still enjoy the privilege of managing our own recruiting. I was unfortunate in not being able to attend these discussions last week, but I saw in the “Times” a report of what passed on Friday, and am therefore, to a certain extent, *au fait* as to what was said on that occasion. The following remark which fell from the author of the Prize Essay particularly attracted my attention :—“In the present position of the “labour market, and the high standard of all wages, we can but draw our soldiers “from the poor, that is, from those who, under the inexorable law of natural “selection, fail from some physical, moral, or intellectual defect in industrial “pursuits.” So much stress has been laid upon this point, and it appears moreover so just, that I feel it requires some hardihood on the part of any one to venture to controvert or qualify it; but I submit, that although no one can be blind to the fact that wages have risen enormously of late years, the scale of remuneration given to soldiers has been more than raised in proportion. I think that almost the only thing necessary to enable us to attain as many and as good recruits as we ever got, is to make that fact known amongst those classes from which we expect those recruits to come. Time will not admit of my going into the question as to how that information had best be promulgated, but I may remark that the circular which I hold in my hand, dated May 1st, 1874, which emanated from the Adjutant-General’s Office, entitled “By Authority, the Advantages of the Army,” was but a meagre attempt to do so, and, as I am prepared to show, the statements contained in it are calculated to mislead, I do think it had much better have been left alone. I will not take up your time by going into it; but anybody who reads paragraph 12, where it says—a soldier “receives medical attendance gratis,” forgetting that he is under stoppages, and which says that he “can save at least £50 out of his pay in “six years,” would allow that I do not speak without some foundation. I have said that *almost* the only thing necessary is to promulgate the fact that the condition of the soldier will compare to advantage with that of his brother civilian. Another thing most necessary is that something should be done to eradicate from the minds of the public at large the notion, or rather the feeling, that the fact of a man enlisting, is synonymous with his going to the dogs. The other day, Colonel Green Wilkinson assured me it is no uncommon case for recruits to enlist in the Shrewsbury district, on the condition that they should be brought to his office in such a manner that the fact of their enlistment should remain a secret from their friends, showing that although the motives which induced them to enlist were strong enough to induce them to take that step, still they felt that they had done a thing which they could not be proud of. On the other hand, I have reason to feel assured that it is by no means the fact, as is stated in that paragraph which I read just now, that men only enlist who are driven to it from want of employment. I myself personally question every recruit who presents himself for my regiment, and I can assure you it is the exception rather than the rule, that men come to enlist because they are out of employment and do not know what else to do. I say, therefore, it is most essential that everything possible should be done to raise the Service in the estimation of the community at large. Perhaps one of the best modes of doing this would be to increase the facilities which commanding Officers now possess of getting rid of their black sheep. Means should also be adopted to put a stop at once to the facility which deserters now enjoy of re-enlisting as often as it pleases them to do so. This might unquestionably be done by reverting to the old system of tattooing with the letter “D,” and the mere fact of this most necessary check having acquired the name of “branding,” given to it by persons of education, who ought to know that to “brand” implies to “burn,” shows that

they felt that they could not possibly succeed in getting it abolished, unless they had had recourse to falsehood so as to exaggerate the horrors of the process. I now beg leave to say a few words to establish what I have laid down, namely, that the condition of the soldier will bear comparison favourably with that of his civilian brother. I will preface my remarks by saying that we do not hear of the same difficulties existing in the Royal Marines, as to finding recruits, that we hear of with regard to the regular Army. My recruiting sergeants have assured me it is no uncommon thing for them to see a recruiter of the Royal Marines pick up, without difficulty, a man whom all their eloquence has failed to entice. And why? Simply because the Royal Marine comes home from his five years' cruise with his pockets full of money. It is no unusual thing for a Royal Marine to come home to his village with £25 or £30 in his pocket, and if a similar result could be brought about with the regular Army, I presume the same readiness to enlist would be shown for the regular Army, as is now shown for the Royal Marines. In the Horse Guards' circular before alluded to, paragraph 14, it says, "It has been calculated that a prudent soldier can deposit 3s. a-week at least in the savings bank, and consequently become master of a capital of £50 on terminating his six years' service, and being transferred to the Reserve." With regard to the means which would enable a soldier to bring home a certain amount of money at the end of his six years' service, it at once occurs to us that the simplest mode would be to keep back a portion of his pay, to be handed to him after his discharge, in the district in which he enlisted, or in any other district in which he may elect to go, by the inspecting field Officer of that district. It is ridiculous to expect that a man should save 5d. a-day, but I do think the soldier's pay is sufficiently ample to enable him to do with 2d. a-day less, and if he has to put up with a little inconvenience, it is for his good hereafter. I propose, therefore, that 2d. a-day should be retained from his pay, to be termed the "reserved pay," and if soldiers who desert be made to forfeit their "reserved pay," the money so forfeited would be added to that of the good soldiers, and so, without any expense to the nation, increase the bonus of the latter. There are doubtless other means by which this reserved pay might be increased. I would suggest that discharges should take place only twice a-year, on the 1st April and the 1st October; that is, that a man enlisting on the 2nd April of this year, should be entitled to his discharge on the 1st October, 1881, and that a man enlisting on the 2nd September, should be entitled to his on the same day. By such an arrangement, not only would a great saving be effected in stationery, correspondence, and all the trouble incident upon the daily discharge of men, to say nothing of the facilities which would be given for sending men home in organised bodies from India after their service there, but it would enable a classification to be made with regard to every six months' enlistment as regards reserved pay. Supposing 12 recruits joined the regiment between the 1st April and the 1st October, 1876, and one of these recruits deserted on the 1st September, 1877, and another in June, 1879, the following sums would accrue to the reserved pay to be divided amongst the other ten who enlisted in the same six months, on their discharge in October, 1882. A. enlisted say on the 1st May, 1876, and deserted on the 1st September, 1877; that would give 460 days at 2d., or £3 16s. 8d. B. enlisted August the 12th, 1876, and deserted June 30th, 1878; 1,417 days at 2d., £11 16s. 2d., the total being £15 12s. 4d. to be divided amongst the remaining ten recruits of that six months' enlistment, each of whom would get one-tenth of that sum added to their discharge bonus. If any of that lot should have purchased their discharge or died, then the reserved bonus of the remainder would be still more largely increased. I would propose that men invalided should also forfeit their reserve pay, provided their incapacity to serve was occasioned by intemperance or certain diseases which may be specified; the only exception to forfeiture under this clause being such men as shall have completed their first term of service and have become non-commissioned Officers, and so allowed to serve longer. That is my idea of how pensions could be brought about without any expense to the nation, and I think that mode would also act as a very useful check on the practice of desertion and fraudulent re-enlistment. I have accepted six years as the term of a man's service, but I am by no means in favour of so short a service. I think the time of service depends entirely on the requirements of the Service, and if those

requirements will admit of it, I am of opinion that twelve years would be a much better term of service, for the reason that we should always have a fair proportion of well-seasoned soldiers in the ranks. At the same time I cannot but express my opinion, that obligatory militia service for one year for every man capable of bearing arms, is the proper thing for this country. It might be accepted by each individual at any time that he chose to select, between the ages of 19 and 25, and I am quite sure that the acquirement of habits of discipline would do no harm to nine-tenths of the population of this country, and, being only for twelve months, I do not think it would be a very severe burden. Of course there might be exemptions, but that is a minor point which I will not go into. There are three things about which I have no doubt. One is that constant alterations in the limits and terms of service cannot be otherwise than detrimental. Another thing I am sure of is, that men are quite as ready to come forward to enlist for twenty-one years, or for life, as for two years, or any intermediate term. During a considerable period, men were allowed the option of choosing between the two, and the number who elected for short service was ridiculously small. The third thing is, that military ardour, or spirit of adventure, or whatever else you choose to call it, is quite as strong in this country now as it ever was, and that the notions of a military life are by no means unpopular in England.

Referring to what Sir Harry Verney said yesterday, I do think greater stress ought to be laid upon the point that the Army should be the only stepping stone to certain small appointments in the Excise, Post-office, and Telegraph services, and that those appointments should be given to no civilian as long as there is a soldier fit and competent to take the place. I should not regret for one moment to see a dozen of the smartest non-commissioned Officers in my regiment go into such civil employment to-morrow, for I feel sure the Service would benefit by it in the long run, and I feel as sure as that I stand here, there are as good fish in the sea as ever came out of it.

Lord ELCHO, M.P. : I came here, not to speak, but to listen, and if it were not for a passage in that pink book on the table, to which I shall presently refer, I should not have ventured to present myself to this very distinguished assembly. But there is a passage in that pamphlet to which I wish to refer, and I can only express my regret that Captain Hime is not present. I am generally in the habit of saying publicly what I think privately, and I would never say behind a man's back what I would not be prepared to say before his face; therefore yesterday, before the meeting broke up, I expressed my regret that Captain Hime would not be here to-day. Before I touch upon this point, just a word about what I feel as to these general discussions. I said I came here to listen and not to speak, because I have this day week, in the House of Commons, a motion which I am inclined to think would recommend itself in its wording very much to gentlemen present. It is to the following effect: "That the state and prospects of our present Army organization, as regards the obtaining of a sufficient and continuous supply of efficient soldiers, are calculated to cause well-grounded apprehension, and demand some immediate remedy, pending the remote and uncertain results of a more complete development of the brigade dépôt system." That is the motion which I, next week, shall present to the House of Commons, and I came here to gather honey, as it were, from the lips of those who may speak on this occasion, and obtain valuable arguments with which to enforce this motion. I believe that, by the rules of this Institution, resolutions cannot be proposed here, and the consequence of this is that the talk wants focussing, that you cannot get clearly at the expression of opinion on the part of the gentlemen here assembled. I do not find fault with your rules, but coming from a place where we proceed by resolution, this is what has struck me. But even without the aid of resolutions, I have seen pretty strong signs of the opinion of the gentlemen here assembled, upon one point at any rate. We had the pleasure of hearing Sir John Adye address us yesterday. I listened, as everybody else did, with the utmost attention to the opinions which, coming from so distinguished an Officer and Official, necessarily have very great weight. He was sometimes cheered and sometimes his opinions were received with silence, but he sat down under an absolute storm of objection to his last concluding sentence—I might call it, of indignant objection to the proposition that the British Army

never had been is so satisfactory a state as it was at the present time. I observe my gallant friend, like myself, has come to that time of life when he finds glasses of use. He spoke with spectacles on, and I have further to observe this of the spectacles that are used by Officers in the War Office, that the glass of which those spectacles are composed is of a most pinky description, and I suppose it is owing to this that they invariably look at everything, especially at Army Reform, with which they themselves have something to do, in the most roseate of lights; and I only account in this way for the question having been viewed by my gallant friend in a light so totally opposed to the views of the great mass of the gentlemen here assembled. I further gather, that the principle of Army conscription is not accepted by those present, that is to say, you do not believe that the time has come for conscription for the Army, and I was afraid no one would get up and say a word for the establishment, or rather for the putting in force of the ancient English constitutional law, as it now stands on the statute book, viz., that for our home Army—the militia—the existing law is that of universal personal service. And when you talk about the Prussian service, I say the Prussian can be shown, in a great measure, to have been taken from our own, for this old English law of personal service existed long before Scharnhorst reformed the Prussian Army, and our volunteer is the equivalent of the *Einjähriger* in Prussia, who is exempt from more than one year's personal service, on condition of his bearing his own expenditure and submitting to the required drill. On similar conditions the English volunteer can escape from liability to personal service in the militia. I was specially glad, therefore, when Colonel Lumley Graham brought that forward, because I have been preaching and writing nothing else for the last ten years, in the House of Commons and everywhere else, in almost identically the same terms. I was very glad that that was received with a cheer, not quite as strong as that contrary cheer which greeted my gallant friend behind me, but it was at least as strongly approved of apparently as was any other question which has been brought before this meeting. Therefore, there evidently is in this room a feeling that it is not necessary to knock away everything that we have got, but that we may make use of the existing law and apply it, and may find in that a remedy for the existing state of things. I shall not further touch upon this point, but I will say this, that it appears to me, though with all deference as to what should be done, there are certain things which are simply matters of common sense, as to what is and what ought not to be, and I shall be very much disappointed if it is not the opinion of this meeting that, as regards the manning of the Army, the present state of things is extremely unsatisfactory; that, in the present state of European armaments and feeling, we ought not to sit still and do nothing, trusting for a remedy to the complete development of the brigade system in 1879. I do not ask you to give any opinion upon the next point, as it might lead to controversy, but my own individual opinion is that, at the best, the brigade *depôt* system is a doubtful and insufficient remedy. I am further inclined to think, if we were at the present moment obliged to raise the existing cadres of our infantry, which are kept between 400 and 500, and which the Secretary of State for War told us would require 58,000 to put them on a war footing, that these battalions would naturally, from their heterogeneous composition, be less reliable and efficient than the more homogeneous regiments which fought at Alma and Inkermann, and in the Indian Mutiny. That does not admit of dispute. The idea of putting into a regiment an additional two-thirds of men who have never seen their Officers, is utterly absurd. I hold that no recruit can be reckoned an effective soldier, fit for service in the field, under twenty years of age at least; that, properly speaking, thirty-five or thirty-six should be the limit of age for soldiers for active foreign service; that the reserve men should be called out, and their existence and fitness tested at the autumn manœuvres and drills; that in the militia,—and this I know was General Peel's idea,—for every man who enters the militia reserve, the Colonel of the militia regiment should be allowed to raise another to take his place; that the militia reserve, therefore, should be borne in excess of the ordinary militia establishment, and that they should be annually trained, not with their militia regiments, because what you want is to work up these men who are to be in the Army with their fellow soldiers with whom they will have to serve, but they should

be only trained with the dépôts of their affiliated line regiments. I have of late been in communication with Officers, in the House of Commons, and with Members of the House of Commons, and that is about the substance of what we are all agreed upon, and I see, by the cheers with which you have received every one of these statements, that I may go to the House of Commons and say they are practically endorsed by the opinions of the able and practical soldiers I have now the honour of addressing.

I now come to what called me really to my legs, and that is a passage which I shall now read to this meeting which appears in that pamphlet, and I do this really in the interests of this Institution of which I am proud to be a member, quite as much as for any other reason whatever. The passage to which I refer is this. Captain Hime says, "But we have 180,000 citizen soldiers, it may be urged. I know something of the volunteers, and my conviction is that the only end gained by supporting them is the gratification of our national vanity. Not long ago an Austrian officer irreverently described them as a harmless joke! They may be a joke, but they are certainly not a harmless one, for they are filling the country with an Army of mock colonels and majors who, if an invasion did take place, would cause incalculable harm by the tenacity with which they would cling to their relative rank." I venture to think that there is a twang of what I may call "trades-unionism" about this passage, which goes far to diminish the effect of what I may call the somewhat dogmatic dicta which are found in that pamphlet. I do not stand up here to defend the volunteers. I do not stand up here to say whether they are, or are not capable of being made disciplined and efficient soldiers. Men as experienced in war as the gallant Captain—Lord Clyde, for instance—have held a different opinion. I leave those two to balance each other upon that point. But what I want to point out to this meeting is this, that in this country we live under a constitution of Kings, Lords and Commons. We live as regards matters of defence and military organization, under a constitution of army, navy, militia, yeomanry and volunteers. That is the law of the land; I do not say whether it is right or wrong. I believe it may be made right by a little screw, and it does not require revolutionary and violent changes, but as long as that is the law of the land, and as long as we have this United Service Institution, consisting as it does of the army, the navy, the militia, the yeomanry, and volunteers, I say it is not well for one officer of one branch of the service to write in the way Captain Hime has done of his brother officers. I use the term "brother officers" advisedly—and why? These gentlemen who hold volunteer commissions have come forward at their country's call; they have done it without pay; they have submitted to great discomfort, great personal inconvenience and pecuniary sacrifices, and they do so because it is the law of the land, and they are told by the responsible military authorities that their services are required for the State. I say, then, that it is not becoming on these grounds to speak thus of these gentlemen; but there are other grounds. It is not becoming for one officer to speak in this tone of others whose qualifications and whose commissions stand on precisely the same footing as his own. What do I mean by this? I mean that the qualification of an artillery officer is fixed by competent military authority; I mean that the qualification of a volunteer officer is equally fixed by the same supposed to be competent military authority; and I say further, the commission of the artilleryman and of the volunteer are both signed by the same sign manual of the Sovereign. I therefore venture to speak in the interests of this Institution, and to point out that there is no branch of any profession, that there are no men who do not, more or less live in glass houses; and that although they say glass is now made so unbrittle that you may in safety throw stones without being able to break windows, still I venture to think the old proverb holds good, and that we had best not throw stones at each other, besides the reasons that it is not wise in the interests of this Institution to do so. For where would such a system end if the officers of one branch of the United Service were to follow Captain Hime's precedent and to write and speak of each other in the tone which this gallant officer has adopted? I can only regret that this statement should have appeared in print. I do not know who is responsible for what is printed by this Institution, but I think in its own interests it would have been wise if a little expurgation had taken place, and if it had been suggested to Captain

Hime that it would have been better not to have placed before the world the passage to which I have ventured to draw the attention of this meeting, and I heartily apologize to you for having ventured to do so.

The CHAIRMAN: Before I call upon any other gentleman to speak, perhaps you will allow me, as having been one of the referees, to refer to this very question. I am sure that no one in this assembly, certainly not one of the three referees, would object to the way in which Lord Elcho has brought the subject before this meeting. He is perfectly entitled to bring forward not only the general question as to whether it is prudent in an Institution of this sort to use any expressions offensive to others, but he also is particularly entitled to defend his own particular corps, namely, the volunteers. The utmost liberty was given to the essayists with regard to the character and scope of their essays, and we, as referees, did not look solely to one point or to another point; it was the general system laid down, the language and various other matters to which we referred in a letter to the Council (not worth repeating to you now), that caused the decision for the gold medal. We do not hold ourselves actually answerable for the good taste, propriety, or correctness of expressions used in those various essays. I do not mean to say there is not a single iota of responsibility put upon the referees, and incidentally, although only incidentally, upon the Council for what is published in their name; but I think on the other hand, that the liberty of expression is so far valuable that it is better not to excise or to interfere with an essay if possible. I will also say, and possibly it may be allowed to express the feeling of this meeting; at all events I may express my own and that of the referees, that nobody can quite approve of the tone of that passage of Captain Hime's essay referred to by Lord Elcho. As I was mentioning just now, there is no necessity for such strong terms, and I am quite sure if Lord Elcho will be kind enough to take it from the general expression of this meeting, there are no people who so value the volunteers, their extreme patriotism and their services of such excellent sort, if we were attacked, as the officers of the Army. It is my firm impression that that is the case. You will find a great number of people who say "you have not the necessary discipline; you are only casually brought together; you have not that feeling that a soldier has," and various things of that kind; but I am quite sure of this that the nation feels and the Army with it, that in the 150,000, or 170,000 volunteers we have an excellent and a very waspish set of people, who would be always dangerously buzzing about the ears of an invader. I think Lord Elcho may be satisfied that there is that feeling in the country, and the casual expression of an Officer, although in a Prize Essay, must not be taken as representing the feeling of the Army.

I have been asked by General Adye to allow time to make an explanation in answer, but I must follow the rule that generally obtains in the House of Commons, namely that an explanation must be confined to something that Lord Elcho may have misunderstood, and as it were mis-stated. If General Adye will tell me that is the case, I dare say the meeting will wish to have any explanation, but otherwise we must not have a second speech.

General ADYE: I am only anxious to get up for one moment to reply to one or two observations of Lord Elcho.

The CHAIRMAN: I think, General Adye, it must not be that. If there is any misunderstanding that Lord Elcho has fallen into, or in what you have said that you wish to explain, that is fair enough, but it must not be a question of answering arguments. It is not with a wish of preventing discussion in any way, but I am quite sure the meeting will feel that we must confine this discussion within proper limits.

Mr. de FONBLANQUE, Deputy-Controller: The impression left upon my mind by Captain Hime's able essay was that he considered the voluntary system of recruiting to have been weighed and found wanting, and that the only remedy was, universal conscription. To my surprise on Friday, and again yesterday, he seemed to shift his ground, and stated that we were all labouring under a delusion in supposing that he recommended conscription. The title of his pamphlet is—"Universal Conscription, the only answer to the Recruiting Question." The question certainly was—how best to recruit the Army? Captain Hime has only given us one solution, namely, conscription. If, therefore, that is not his answer, I am afraid that he has obtained the gold medal under false pretences, for if conscription is not his answer,

then he has given none whatever. We are, however, here not to discuss what he has said, but what he has written; and I accordingly take his essay for my text. In the first place, then, I must express my entire dissent from his two main propositions, that the voluntary system has broken down, and that universal conscription is the only system that can replace it. He admitted the other day that his proposed remedy was a very desperate one, and compared it to the amputation of a limb in order to save a life; but he seems to me to have overlooked the fact that a humane and skilful surgeon, before he amputates a limb, satisfies himself that he cannot restore it, patch it up, and make it useful somehow; and I am quite certain, although the voluntary system may not at present work as well as it has done in times past, that it will again answer every purpose, and that without any desperate operation whatever, we shall continue able to recruit our ranks as we have done for the last 200 years. I will not go the length of Sir John Adye, who declares that our Army was never more efficient than at present; and who, with all the courage of an English Officer, actually quoted a War Office return in support of this proposition. Now I have long served in the same department in which Sir John Adye has recently become a member. I have passed the best years of my life among official returns, and I know, from personal experience, what they are worth. You will, perhaps, allow me to give you an illustration. While I was in commissariat charge of a division in the Crimea, I received an order in the spring of 1855 to furnish a return of the number of days during which my division had been short of rations. That number was, unfortunately, considerable, but when I came to work up my report from the only materials at my disposal—official documents—not only did I establish that the men had had full rations for every day during the whole of that winter, but that for three weeks of that time they had had double rations, and that so far from having been starved, they had been greatly over-fed. When I showed this return to Lord West (a member of the Board) he said:—"This is very satisfactory, but pray are these facts or figures?" I said—"They are figures." "Well then," he said, "throw them away." So much for the trustworthiness of official returns, however conscientiously compiled. Now as regards conscription, I am surprised that anyone can, for one moment, seriously entertain the idea that it would be accepted by the British public of any class. Captain Hime speaks of it as being irksome to the poor and distasteful to the rich, but the class it would affect and offend most is the largest and most influential class in the country, namely the middle class, whose feelings and interests would be most outraged by such a law. Again, our insular position, as all admit, makes the Navy our first line of defence; and if conscription were necessary for our Army it should be even more so for the Navy; and yet although many Naval Officers complain that they cannot get the right sort of sailors, I have never yet heard any one recommend conscription for the Navy. There is another point upon which I will touch. There is no public question that we can discuss without considering that which it always resolves itself into sooner or later—viz., *£ s. d.* To that question Captain Hime has completely given the go-bye. He proposes a voluntary Army for the Colonies, and a conscript Army for Home. The Army to serve in the Colonies and India must necessarily be a long service Army and confined to climates more or less unfavourable to English constitutions; consequently these men will require a higher rate of pay than is now given. How is this additional charge to be met? We have 68,000 men serving in India and the Colonies, therefore, we may say that nearly one-half of the Army would be in receipt of a very much higher rate of pay than at present. Are we to meet the expense by reducing the pay of the conscript? Are we to assimilate the pay of the conscript soldier in England to that of the conscript soldier abroad, which is merely nominal? in other words, are we to say to our new conscript Army—"Hitherto we have had 'voluntary service at one shilling a day; for the future we will have compulsory 'service at sixpence a day.'" But even then the cost of the proposed Army would be in excess of the present one, and I should like to see the statesman who would get up in the House of Commons, and in one and the same breath propose to impose a law obnoxious to the instincts of every Englishman, and a very large increase to the Army Estimates to meet the expense consequent upon the introduction of this law. I regret that Captain Hime is not present, because I should have liked to put one or two questions to him on the subject of expenditure. I will conclude by saying that

if it be true, as he asserts, that "no sane man" can have a doubt as to the success of his scheme. I must, in common with many others at this meeting, rank myself among the non-sane part of the community.

Colonel AIKMAN, *V.C.*, Commanding Royal East Middlesex Militia: Sir, I presume it is the object of this meeting to discuss Captain Hime's excellent paper rather than to form theories of our own, or to enter into the question of reorganization of the Army.

I shall, therefore, confine my observations to a few points of the essay, as the statistics and figures contained therein do not appear to justify the conclusions arrived at by the author in regard to recruiting.

We must, however, admit that the essay contains a great deal of useful and reliable information, showing clearly the amount of desertion in the various branches of the Service; where that desertion has been most prevalent; and the causes during the past century which have produced it.

The figures show that desertion is more prevalent in short than in long service, though the former is more popular than the latter.

When desertion takes place in the latter it is found at the commencement of the term when the pension is far distant. If the recruit gets over the first few years, desertion decreases; and, as the pension draws near, it entirely ceases. This shows that the less popular service is accepted on account of the pension, and that prospective advantages are highly prized.

It is evident, therefore, that by a compromise between the terms of long and short service, a suitable arrangement might be found to produce a sufficient supply of able-bodied men to meet the requirements of the Army at home and abroad without resorting to conscription.

Captain Hime informs us that while the pay of the soldier has slightly improved his income has enormously increased of late years—that heavy expenditure has been incurred rather in improving the soldier's condition than in increasing his salary. It is true that comfortable barracks, wholesome food, well-arranged hospitals, and good medical attendance have been provided for the soldier, but if we look into the condition of the working classes we find politically, socially, and morally, the improvement in their circumstance has been even greater. Wages have been considerably raised, and hospitals provided at the public cost.

In comparing, therefore, the income of the soldier with that of the civilian, the cost of living should be dismissed from the calculation, and we should ascertain how much each has to spend after the necessities of life have been provided. I think it would be found that the soldier is the poorer man of the two. If we look into the homes of the poor, possibly we find less space, less cleanliness, and less fresh air to breathe than in the barrack-room; but the civilian has what he prizes most, and what the soldier does not possess—his liberty; and though the dwelling in which he lives may appear wretched, it affords good shelter, and the position, to those accustomed to it, is by no means so bad as we imagine it to be; and, on the whole, compares favourably in their estimation with the monotony and restraint of military life.

We are next told that there is a growing disinclination among the industrial classes to enter the military service; and that as trading operations have extended, the military spirit of the people has declined. We have only to look at 180,000 volunteers, composed of all classes, performing military duty voluntarily, to be convinced that the military spirit of the nation has never been higher than at the present time, and this may be ascribed to the thorough absence of compulsory service.

The essayist suggests that the Reserve soldier will not be forthcoming when wanted, while he infers that the conscript will.

There is nothing to support this conclusion. On the contrary, there is considerable evidence to show that this charge, which has been repeatedly made against a body of deserving men, who are entitled to our confidence from their past services to the State, is without foundation.

Let us take the case of a militiaman to show whether these people are given to breaking their engagement. The man enlists generally in winter, when in distress, for the sake of a few shillings, which are deducted from his bounty at the end of his training. He is usually a man of unsettled habits, with no fixed residence, or

regular occupation. If he choose to desert, there is little chance of apprehending him; yet when summoned for duty, at a time when he may be in remunerative employment, he comes at considerable sacrifice and inconvenience to himself, while his family are often left destitute and dependent on the workhouse. I grant that many disappear, some leave the country; but when we find an average of nine hundred men out of a thousand on parade, and that the militia have done good service in time of war, it can hardly be said, that as a class, they do not meet their engagement. Then there are the militia reserve men, of whom we have some 28,000. They are selected men of good character who accept the responsibility of leaving home and family to be drafted into the line in time of war. And what do they receive as an inducement to enter into this important compact? The magnificent sum of one sovereign annually extra bounty!

I have nearly 400 of these men in my regiment, and, by an increase of the bounty, could double the number, and yet we are told that voluntary service is expensive and not procurable, and that conscription, so distasteful to Englishmen, is the only remedy.

If men on whom we have so slight a hold have been found to do their duty in times of peace and war, surely the Reserve soldier who has something to lose, who attends periodically to receive his pay, whose address, description, and occupation are well known, would be found at his post when wanted.

Having endeavoured to show that military service is not distasteful to the people if suitable terms were offered them, and that the field for voluntary enlistment is by no means exhausted, I will briefly state in a few words what is needful in my humble opinion to draw recruits, and the kind of service which I believe would be found very attractive.

1st. We require a simple and intelligible code of regulations showing exactly what the soldier is to receive, and the career which is open to him.

2nd. That a mixed service in the Militia Reserve and the Army extending over twenty-one years should entitle the soldier to one shilling per day pension.

By some such arrangement as this, the militia would be able to send to the Army men fairly trained, physically fit, and of mature age who would, on entering the line, at once add to the fighting strength of the service.

The recruit wishing to join the Army under this arrangement would enter the militia service, say at 18 years of age, and serve four years. He would then enter the Army for six years. Having thus completed ten years' service, six of which have been passed in the line, he would return to his militia battalion (where the military element is so much needed) for eleven years more, thus completing twenty-one years' service, during which time he has been available for war. He would now be transferred to the pension establishment.

The saving effected in rations during the 15 years in Militia Reserve would more than cover the expense of pension. Now what have we been asked to accept as the result of Captain Hime's investigation:—

1st. That the militia is not a reliable force.

2nd. That the Reserve soldiers would not be forthcoming; and, if they were, would be little better than raw recruits; or, in other words, a military mob, the worst mob of all.

3rd. That 180,000 trained volunteers are a harmless joke. Now, Sir, the expressions indulged in towards this force, and particularly towards the Officers of it who have Her Majesty's Commission and wear the national uniform are very objectionable, indeed insulting. Lord Elcho, however, has met them very ably; but what are we asked to do to repair the alleged sad state of our military institutions? We are simply asked to expunge the British Army, which has hitherto been found in quality equal to any in the world, and to substitute for it 100,000 young civilians of twenty years of age and of one year's service or less, a training but little better than that of the volunteers as far as making a soldier is concerned; and these young men are to form our first line of battle. My humble opinion is that a force so constituted, would be a harmless joke indeed in the presence of a foreign European Army, and not nearly so effective in such a position as Lord Elcho's men behind defences and such other places as would be assigned to them in the field. But returning to the *Price Essay*. There is not a single word touching upon the best

means of procuring recruits for the Army considering its varied duties in peace and war; and, as many of the essays doubtless contain much useful information on this subject, some of the best might be printed to form a volume of the *United Service Journal*, which would be a useful book of reference for those who are entrusted with the difficult task of recruiting and improving the fighting power of Her Majesty's Forces.

Major-General MARRIOTT: I did not give notice of my intention to speak at an early period of the discussion. It was only yesterday, when one speaker after another seemed to me to take the opportunity to express his opinion on matters of detail, while the essay itself did not receive adequate criticism, that I sent in my name as desiring to speak. Since then, in some respects, the defect has been supplied, and one or two points especially have been met. I desired to say something about the alleged decay of the warlike spirit, but that the last speaker and Colonel Fielding have adequately dealt with. I also desired to have noticed the contempt thrown upon the body of volunteers, but Lord Elcho's speech obtained an expression of opinion from the assembly, which renders further notice of that unnecessary; but I still feel that the essay has not been adequately criticised.

When I heard of a proposal, so opposed to the traditions and to the social and political constitution of this country, as "universal conscription," I took up the essay expecting to find it at least supported by grave and weighty argument, and I confess it was with surprise I found the most important points simply assumed, assertion substituted for argument, and the most critical questions avoided altogether, and that even with all these aids, the argument was only brought to a conclusion at the cost of the most extraordinary inconsistencies. Two of the principal points on which he proceeds are, first, that we require a very much larger body of fighting men than is already proposed. Speaking of the Army of 1873, when there were 103,000 men for the home service, beside the whole body of the auxiliary forces, he says it is a force with which it is impossible for us to defend the country in case of invasion; and again, that it is sheer madness to risk our liberties in times like the present, upon the success of such a force. The assumption of the numerical inadequacy is really essential to his argument, because he admits that there has rarely been a scarcity of recruits for long and life service, and therefore, to get rid of the objection that the voluntary system has been sufficient on those conditions, he is obliged to assume that we require an immensely larger force, and to back up that opinion he has to speak of the whole of our auxiliary forces, and especially the volunteers, in a manner which I should have noticed at some little length, had not the feeling of the meeting been markedly expressed already. But I must say, that to treat 150,000 men of the very class from which his conscripts would be taken, a class so superior that he thinks one year's training would suffice to make complete soldiers of them, men who have learned to manoeuvre in battalions and are accomplished in the use of the rifle, and who, for the most part, by their education and intelligence, readily apprehend the significance and value of what they have learned; a body actuated by patriotism or military sympathies, and giving willing not compulsory service—to say that such a body of men, at a time of invasion, when their feeling of devotion and ardour would be kindled to the utmost, would be useless, seems to me the veriest professional pedantry and conceit. He gives three "insuperable reasons," fatal objections, he says, against the voluntary system in any shape, viz., that it cannot give a sufficiently large force, that it is enormously and intolerably costly, and that such men as it supplies are of the worst quality. As respects the second objection of cost, I could hardly believe that I read right on that subject, when he assumes not only that the cost is to be very much less, but actually that the cost, not even of an Army of the present strength, but of an Army of the strength he would have it, would be about one-third of the cost of the present Army. The last Army Estimates are 13½ millions, and the total expenditure of every kind of pay and allowance, from the Commander-in-Chief to the drummer boys, for every branch of the Army, is 4½ millions; so that if the present British Army would serve without any pay whatever, the total cost would be about three-quarters of what it is at present; and yet he says by conscription we are to have an army much larger, at one-third of the cost. What is one to say to such arguments as these? Why, after the great constitutional

objection to a conscription, the next great objection is its cost. It is the most costly system you can possibly have. Where is the saving to be? He says himself, that the soldier is paid less than the day labourer. Does he mean that the labourer whom you take from his labour, the artisan whom you take from the workshop, the man whom you take from his desk in the counting-house, is to be paid less than the day labourer? Where is the saving to be? The indirect cost, on the contrary, of taking men out of square industrial holes, to put them into round military holes, must be enormous. So much I have desired to say on two of his insuperable objections—the cost and numbers. The third objection is quality. On that point there is more semblance of argument, but even in that argument there is fallacy. He says—and the words were quoted by Colonel Fielding—we have to take them from the men “who fail from some physical, moral, or intellectual defect in industrial pursuits.” A great many men fail in industrial pursuits, because of a restless and adventarous character, which makes very good soldiers, but I need not repeat what has been said on that subject. He omitted the most critical question of the matter of exemptions. He proposes universal conscription with exemptions, but omits any scheme of exemption. It would be waste of time to state all the possible conceivable plans of exemption and the objections to them; it will be time enough when Captain Hime supplements his essay by a statement of exemptions, to exhibit the difficulties they would involve. The inconsistency with which he concludes is so great that he is obliged himself to notice it. He says, “It may be said to be a monstrous contradiction, first to prove the voluntary system to be a failure, and then to propose a voluntary Army for England and the Colonies. I reply in the first place, that we have no choice in the matter.” The contradiction is really still greater. He did not merely say it was a failure. He said the other was the only possible system; but nevertheless we must adopt another, and it is to be presumed impossible one, because we have no choice. I do not see the value of arguments such as that. He concludes by words which combine all the assertion, assumption, and fallacy that characterise the whole. He says that conscription “is a logical and necessary consequence of the industrial progress of modern Europe.” I should have rather thought the logical consequence of industrial progress to be, as he himself says in another part of his essay, that men adopt the profession of arms, on the same prudential grounds that they adopt other professions or callings. The traditions of a nation and its government will not be changed by such mere assertions as these. Military constitutions are not made, but grow like other constitutions, and moreover they have their roots in the political constitution of their country, and they cannot be torn therefrom and replanted in a foreign and imported soil. Guidance for the future we must seek in the past, and I cannot say that I see in the past what the essayist sees—the sure foot of conscription—I see no trace of it, nor do I see the decay of the warlike spirit to which he attributes the necessity of conscription. For myself I do not believe that it is to the decay of a warlike spirit that the unwillingness to enlist is due. I believe that that unwillingness is twofold, in both directions derived from the original constitution of our first standing armies which were recruited by vagabonds and convicts. One consequence has been that the wages of soldiers have always been low compared with those of industrial occupations. Another consequence was the necessity for a system of the severest and the most despotic government, the character of which has impressed itself on our system to this day, but we have been continually modifying and diminishing that character of severity and servitude, and it is in that character that the great difficulty exists. From all that I can learn, it is more often the influence of friends rather than the feelings of young men themselves, that prevents them coming forward, because there is the traditional idea derived from those old days, that a man who enters the Army, sells his freedom. I believe that with some improvement in wages, which the country could easily pay, and allowing for the time necessary for gradual change and development in a body so organized as the British Army, there is nothing to prevent the position of the soldier, becoming as free as that of any other citizen who serves in large organized bodies requiring exact discipline and obedience; and excepting perhaps the prejudice which persists, after the grounds for it have been removed, there is

nothing which will necessarily prevent the Army becoming as attractive in the lower ranks as it is and always has been in the commissioned ranks.

Mr. RALPH KNOX, War Office: I am sure I owe some apology for venturing to put my name down to offer any remarks to this assembly; but it so happens that during the last ten or twelve years I have been more or less mixed up with, and certainly at the birth of, a great number of the changes that have taken place in Army organization, and I think perhaps I may have one or two ideas derived from that experience, and critical of the essay, which may help those present to come to a conclusion upon the subject. The discussions held at this Institution are, it appears to me, very useful, if only for the reason that they elicit the fact, that amongst Officers themselves, on Army questions, there is such an extraordinary difference of opinion. Questions of organization and of Army management, so far as they include strictly military points, one would suppose might form quite an exact science based on experience, and certainly there is nothing in the nature of the subject which ought to admit of so great divergence of opinion; and until there is something more like a unity of view upon these great subjects amongst military Officers, military opinion will never have its due weight, and it is hopeless for us to expect any satisfactory course to be adopted. Those who have to take up these questions and deal with them in a practical way, are entitled to every possible indulgence. For amid the chaos of military opinion, it is very difficult to decide as to what should be done, and to arrive at practical conclusions to lay before the country. That duty is a most wearing and irksome one, and many men have fallen under it, and I am sorry to have to mention to-day that one more is added to that long list of men who have died while at their work in the War Office; for the sad news has just reached us of the death of Colonel Middleton, Deputy Adjutant-General of the Royal Artillery, one of the most laborious, painstaking, earnest, thorough soldiers who ever stepped within the walls of the Horse Guards. In dealing with the question under discussion, I think, in the first place, we ought to ask, what is it we want our Army for? And unless we can come to a satisfactory conclusion as to that, we cannot decide this question in any satisfactory way. It appears to me that, from the fact of Captain Hime having ignored altogether what we want our Army to do, he has fallen into the extraordinary error of recommending conscription. So far as I have been able to study the subject, it appears to me conscription is the only impossible solution to the problem of Army organization. Now, what duties must our Army be prepared for? Is it simply the duty of home defence? It is nothing of the kind. If this were the only problem that had to be solved it would be the simplest in the world. But what is the case? It is clear that Captain Hime has heard of India, because he proposes a separate Army for it. He also has heard of the Colonies, because he proposes a separate Army for them. But is it sufficient to say that there shall be a separate Army recruited for India, amounting to 60,000, and for the Colonies 20,000 men, and so on? By no means. The glib answer with a very large number of Army reformers is, "Adopt separate recruiting for Indian service." "Return to the system of a separate Army for India." Now the plan never existed of a separate Army for India. A separate 10,000 or 12,000 men existed for India, but 10,000 or 12,000 men is not an Army; and what is the requirement of India at the present time? What number of Europeans have we there now, recruited in this country? 60,000 men, and that 60,000 men is known to be the very minimum force that must be constantly maintained there. This is not a question of what our home defence is. It is also a question of holding India, and that means our power to send out there 30,000 or 40,000 more men at a moment's notice. And can 40,000 more men be sent to India from a "conscript 'home Army'?" It is not necessary to go into the question of the value of India to this country. We are the conquerors and rulers of India, and we must hold it: but unless we possess the power of sending 40,000 additional men to India at any critical moment, we at once surrender our power to do so. Captain Hime's scheme is the only one under which it would be impossible to provide these reinforcements, and therefore it is utterly unsuited to the formation of an Army for this country. And then what is the case of the Colonies? Have we no duties to perform to them? Why have we withdrawn from colonial stations all over the world the troops that were there? Simply that we might have a strength at home, that

when the emergency arrived, we might pour that whole strength into the particular colony that required it, instead of having our troops at distant stations where they were not available. Captain Hime's plan prevents that being done. He says, a conscript home army is the only possible answer to this question. I say it is the only answer that is not possible. So far as regards foreign service ; and now, what is the problem as to defence of these shores. On this point we are sadly in want of a definite military opinion. There is an extraordinary want of unity in the views of military Officers as to what force it is necessary to have on these islands, should we be threatened with invasion, and our fleet be destroyed. Upon that rests the whole question, whether we should have a conscription or not ; and it would be an enormous advantage to have some definite conclusion upon it. It has always struck me, the problem ought to resolve itself into a measure of the force which it was possible for any foreign nation to suppose it could successfully land in these islands. That is to say, supposing we had only one soldier, it would be very easy to invade us with ten ; so if we had 50,000 soldiers it would be comparatively easy to invade us with 80,000. But it must be admitted that there is a force that it would be a practical impossibility for a foreign nation to embark with a hope of successfully landing upon our shores ? Is that a very large or a comparatively small army ? I cannot but think, so far as I have been able to look into these things, that the views of some soldiers are very much exaggerated. They seem to think it is necessary to have an enormous body here to prevent the hope of any foreign nation invading our shores. I remember being present at a very interesting discussion in this room, as to the power of shipping men and landing them in this country, and it struck me it was easy to put figures upon paper on mere supposition ; but the practical conclusion was, that the embarking of an army from necessarily a few ports, on board enormous ships, sailing them across the seas, and landing them again, is by no means such an easy thing as on paper it may be made to appear. Now supposing we may say it is a very difficult thing indeed for 150,000 fully equipped and armed men, with all the appliances required by modern warfare, to be embarked and landed on these shores, what force should we maintain here that would compel a foreign Power to decide that at least that number of men must be sent, or no good would come of the expedition ? On this question entirely depends the solution of what we want in the way of an Army, and how it must be raised ; because if it be the case that 120,000 soldiers, *i.e.*, four *corps d'armée* of 32,000 men, distributed on strategical points in the country, each completely equipped and always ready for service, if that force is sufficient to deter a large expedition with any hope of success from coming upon these shores, then the long service system, pension, and recruiting, similar to that which was in vogue subsequently to 1847, would be perfectly ample to provide that force within our present expenditure ; that is to say, we might have 30,000 men more than we now have in this country—making up 120,000 men, completely equipped, cadres always full, old soldiers, pensions, and everything that the old-fashioned soldier admired most, for the same money that we spend now. Because, I assume that you would get rid of your militia, volunteers, and auxiliary forces, simply for the reason that you do not want them ; because, by this hypothesis, 120,000 men, perfectly drilled, completely equipped, and always ready, is sufficient to protect this country. But if, on the other hand, 120,000 men are not sufficient to deter a foreign country from sending an army to invade us, and it is necessary to maintain large Reserves, because it can be shown by military evidence that 200,000 men or 300,000 men can be landed, then you must have a very much larger Army to defend these shores, and they must be as thoroughly trained as those men who are likely to land ; that is to say, suppose 300,000 men can land, you must have 300,000 men, equally well drilled, to go against them, and it is no use thinking the militia drill and the volunteer drill, as it at present exists, would be sufficient to back up your force of 100,000 regular soldiers. You must resort to something which will make every one of your men, man for man, equally well trained with those soldiers who may be serving in the invading armies. These are the ideas that suggested themselves to me on reading Captain Hime's pamphlet ; and I hope I have shown, with a fair amount of success, that Captain Hime's prescription of universal conscription is the only system which is inapplicable to the requirements of the country.

Lieut.-General the Hon. Sir ALEXANDER GORDON, K.C.B. : The last speaker mentioned the want of unanimity among military Officers, but I think military Officers here present have shown great unanimity in the condemnation of Captain Hime's proposals. It appears to me Captain Hime sat down to write an essay upon recruiting the Army, and finding it more difficult than he expected, he has written an essay on the origin of military service in the Army. His essay is a very interesting *résumé* of what has occurred in the last 100 years, but he entirely fails to grapple with the question before us, which is,—“The best mode of obtaining recruits for the Army ‘serving in India and the Colonies.’” There is not one single allusion in Captain Hime's essay to this subject. It would be very interesting to this meeting if it could be informed of the grounds upon which this essay was considered so superior to the seventy-eight other essays as to obtain the gold medal, because it has avoided the real question which the Council submitted to the Officers of the Army.

The CHAIRMAN : I think that that is not a question which we can answer.

Captain LORTUS FOX, Longford Militia : I shall not venture to offer any opinion upon the relative merits of the systems of voluntary and compulsory service, but where a question of Reserves is under consideration I may, as a militiaman, be permitted to state my conviction that we ought not, and that we cannot lose sight of the militia. It must be remembered that though we have a promise of a reserve from the Army, we have at present seen very little of that Reserve, and that it will be some time before that Reserve can be put into working order. The new system of organisation cannot be improvised in a moment, it must be a matter of time, and in the interim we have no Reserve except the militia to fall back upon in case of an emergency. But, further than that, let us suppose that the Army Reserve, as contemplated under Lord Cardwell's system, was in full force, supposing the 60,000 men, to which I believe it is limited, were all there, what would be our position in case that emergency took place? Supposing a foreign war, or a foreign invasion, what would be the first result? Why, that 58,000 or 60,000 men would be immediately required to fill up the existing battalions to a war footing. Where then would there be any Reserve but in the militia? and is it prudent, under those circumstances, to throw away what you have, before you have anything to take its place? Taking the conscription principle to be the one for the future, that would still be longer bringing about than the present system of Lord Cardwell, because it seems to be generally agreed that this country is not at present prepared to adopt conscription, and if we are at any time to come to it, it must be at some distant period, and what are we to do in the meantime? Besides which, I think the very system of fostering and encouraging the auxiliary forces, supposing we be, by the course of events, obliged to put ourselves in harmony with the systems prevalent now on the continent, would tend more than anything else to smooth the way for its adoption. What better training or education could there be for the people to adopt willingly the system of conscription than to make men of every class acquainted with the principles of soldiering, not only those professional soldiers who make it their business of life, but also of other portions of the community (and they are becoming more numerous every day) who have not only the leisure but the inclination for intermittent soldiering?

Having, I think, shown that we have at present no Reserve but the militia to depend upon, and that for many years we shall have no Reserve that we can count upon, and even if we had a Reserve, that we could not do without the militia, I think the first thing we ought to do, is to try and improve that militia as much as we possibly can. It can be done very easily, because it involves no new principle whatsoever. You have the militia cut and dried ready to your hand, and above all, willing. I was very much pleased to hear from the gallant Officer who spoke before me of the willingness with which all ranks of the militia (Officers and soldiers) come up at their annual training. I can corroborate that statement, for I come from Ireland, where the population is more restless, more given to wander and to emigration than the people of this country; and, after nearly twenty years' service in an Irish Militia Regiment, I am amazed at the strong musters it makes year after year. The way men turn up, I may say from the ends of the earth, is most creditable, the number of what may be termed wilful absentees is small—in my own company they have been very few; I do not think for several trainings I have had more than five or six

men absent. That speaks strongly for the fact that if you are to have a Reserve, why should not you use the materials ready to your hand, and that are willing to be used. Then comes the question, not only are they willing, but are they efficient? On that point I am afraid I cannot give a satisfactory answer—but it is not our fault. It is not the fault of either the Officer or privates of the militia that they are not more efficient. We cannot soldier a day longer than the term prescribed for us; but that we do not object to increased efficiency may, I think, be proved by the fact that though the term of training for regiments has been increased from twenty-one to twenty-seven days, and for recruits from fourteen days to two months, we find the militia coming forward for their annual training more freely now than they did formerly. That being the case, what can be more obvious than that the first thing to do is to try and put your militia upon a satisfactory footing. It is not only easy to do, but it is the cheapest way in which you can raise your Reserve. In a paper read in this Institution some years ago¹ I laid down two points, that you must improve the training of the men and the education of the Officers. I ventured to suggest a system by which the third part of the militia should be called out annually for three months, a third portion for two months, and another portion for one month; in other words, every militia regiment would triennially get three months' training. I do not say that that would make us perfect, I only throw it out as a suggestion; military men are more competent to deal with it than an outsider like myself, but some step should be taken in that direction. Surely no one supposed that twenty-seven days' training, or any annual repetitions of twenty-seven days' training, let them be repeated *ad infinitum*, would ever make a man a soldier; and if it did, if twenty-seven days, or any number of repetitions would, what is the use of your Army, because then soldiering would be an inspiration, it would not be a science? You do not require continuous training if that could be done, so, consequently, some step in that direction must be taken, if the militia is to be made useful. One word more, and really this is after all the most important question we have to deal with in the whole of this discussion, and it underlies the efficiency not only of the militia but of any Reserve, and that is the importance of the military education of the Officers. There has been during the last few days a good deal of prophecy going on in this assembly, and I regret to see the prophets, generally speaking, have met with very little favour. I think I can quote to you a prophecy which will obtain your approbation for two reasons; first, because it has been fulfilled; and secondly, I think the name of the prophet itself will be quite sufficient to secure your respectful attention. I allude to an extract from a letter written, years before those continental systems came into vogue, by Sir John Burgoyne, who said, "All the propositions hitherto advanced have in view only the improvement of the private soldier of the Reserve, when what is of more importance is, a Reserve of good Officers and Non-commissioned Officers, for clearly a regiment of very inferiorly trained soldiers, under a complement of good Officers and Non-commissioned Officers, would be far superior to one of first-rate trained soldiers under inefficient Officers and Non-commissioned Officers. The first would rapidly improve, while the other would as rapidly deteriorate."

Then the question is, how are you to provide an improved class of Officers? A gallant Officer, who spoke the other day, proposed that the militia should be officered by the Army Officers. I can scarcely suppose him to intend that men on full pay were to be sent altogether to officer the militia, because I cannot see, merely, as I said before, as an outsider, where they could be found. You require some 4,000 Officers; and it strikes me the active Army can scarcely supply 4,000 Officers to officer the militia. I rather suppose he referred to men who had been in the Army at some time; and, to a certain extent, I venture to express my humble opinion that that would be a very good idea, and, in fact, it is already carried out to a certain extent. Out of 3,000 Officers in the militia, we have something like 750 who have been in the line, and most of these, I am sure, are a very great acquisition to us. They are men, generally speaking, who entered the Army, not with the intention of remaining there any length of time, but they went in as gallant

¹ "Our First Reserve," by Captain L. Loftus B. Fox, Royal Longford Rifles. Journal, Vol. XIII, page 1. 1870.

gentlemen of England do, knowing that it is a good school for them, and they are of the greatest possible use to us. But they are not sufficient in numbers to officer the whole of the militia. And then it would come to this, are you to offer a premium? are you to say that no one is to get a commission or to have the control or direction in any way of a militia regiment except a man who has been in the Army? Are you to go and hunt up all those men who, for excellent reasons of their own, having once put their hand to the plough, looked back? I can scarcely believe that is a desirable way of officering the militia. And beside that, allowing that we must have a military element, and I should not be at all sorry to see it increasing in the militia, I do not think that what I may call the civilian element ought entirely to be eliminated. I say so because I think men will work better, I may say that I find it, that half-trained men will work better under the supervision of military men, such as adjutants and ex-lieutenants, or by having also Officers who can have more of a fellow-feeling for their infirmities, and who, like themselves, are not professional soldiers. I think that would go a long way with them. I think it would encourage what is a most wholesome feeling in the present day, namely that every man owes military service to his country, be he civilian or be he professional soldier, and that whenever he can get the opportunity to serve his country he ought to do it.

This is a large subject, and I have not time to enter fully into it now. I will only venture to add one suggestion, it is this—make it compulsory on every one who seeks a commission in the militia, that he shall have a twelve months' training, in a military dépôt, or with a line regiment before he is gazetted, or serves with any militia regiment. Do that, and you will have gone a long way towards making the militia an efficient Reserve.

Captain NEEDHAM, R.M.A. : I had intended to make a few remarks, speaking as an Officer of the Royal Marine Forces; but I find that Colonel Fielding, in his allusion to that corps, has forestalled me in much that I was going to say. I will, therefore, merely supplement that part of that Officer's speech in which he spoke of the comparative facility with which recruiting sergeants of the Royal Marines picked up recruits. That there is no great difficulty experienced in obtaining the number of men annually required for our forces is perfectly true, but I believe it is equally true that 15 or 20 years ago, men were even more easily obtained; and yet the conditions of service in the Royal Marines have not changed since that time. Men enlist for the same number of years now as then, obtain the same pensions on discharge, and during their service receive, if anything, rather better pay. Why then this falling off in the number of recruits? It may be partly owing to the general rise of wages in civil life; but I think the main reason is to be found in the alteration which has been made in the system of payment. Formerly the great bulk of the pay of a marine embarked, was kept back until he returned to headquarters and, as a marine serving on board ship receives a free and ample ration, a man would frequently take on furlough with him, after a three or four years' commission, £60 or £80, or even a yet larger sum. Now, a marine is paid the greater part of his pay on board ship, from time to time, consequently he no longer takes with him when he goes to visit his friends after his cruise at sea, the large sum that he did formerly, and it is owing to this fact that I think that the marine service is no longer so popular as it was, among the classes from whom we obtain our recruits. What I would deduce from this experience is, that some such system as that recommended by Colonel Cox yesterday, and by Colonel Fielding to-day, some system of perhaps not paying the men more highly than at present, whilst they are actually serving with the colours, but of giving them a handsome remuneration when they are at home with their friends, will be found the most effectual way of providing the necessary supply of recruits for the Army.

THE CHAIRMAN : We have now exhausted the list of speakers. We have had a very full discussion, and on the whole I hope the meeting and the profession generally will feel it has been a very creditable discussion. I will not enter into the question myself further than this. It was mentioned by Mr. Knox, of the War Office, that there was a great deal of uncertainty from the variety of opinions in the Army upon various points connected with the Army; but I think on two questions there is no uncertainty; one is that the actual recruits, the actual body of the rank and file, are those who form the foundation of the Army; they are the people, of

whom the Non-commissioned Officer up to the General Officer are the mere staff to arrange the effective fire and the work in short, of those private soldiers in the ranks. If that is the case, we want for the very foundation of the Army, the best men that you can get for that purpose. Now if I am to take the general result of the 79 essays which three of us read lately, there is no doubt we do not get the man that is efficient for our purpose. I think there was scarcely an exception in the general tone of the whole of those essays, and coming from all ranks, that we do not get the man that is most serviceable for our purpose. Now if we do not get the man that is most serviceable for our purpose, we get a most expensive article. I ask any Officer to trace the career of one of these weakly lads of 18 from the time he receives the money of the Crown till he goes out on foreign service; he is there put into hospital, probably remains there for some time and comes back again invalided. During the Indian Mutiny I remember reading of men who were sent out and were at once put into hospital, and out of a detachment perhaps of twenty, one-third would come back never having done a day's real soldiering. That is the case in all expeditions wherever there is hard service. If we could, as a general body of Officers, bring to the notice of the Government, by the discussions that take place here, the money value, as well as the value of the credit to the Army and Nation, of getting efficient men, and no others, for the staff to act upon, we should then be doing a very great service to the authorities in this country. I look upon it that one object of these essays and of the opinions expressed here, is to impress that in the strongest possible way upon the Government of this country. I hope, therefore, that this being a place where we can express our opinions very freely without any restraint, except that imposed on us as Officers and Gentlemen, towards the Government and Crown we serve, the Government will really pay attention to that which is the general feeling of all Officers in the Service from the highest to the lowest, namely, that we must start with good material in the ranks, in order that then the Officers may be able to do properly the duty of the Army.

I do not know that there is anything I need further refer to. I am tongue-tied rather with regard to the question of the Prize Essay on Recruiting, but we three referees gave the subject our best consideration and came to that decision; I do not go into the reasons why or wherefore, but that was the settlement. I think the Prize Essay is a very able pamphlet, although some of us may not quite agree with many of the terms employed in it. We may now consider the meeting dissolved and the question closed.

General STANHOPE moved a vote of thanks to General Sir William Codrington, for his able and courteous conduct in the chair, and the motion was carried with acclamation.

Evening Meeting.

January 18, 1875.

VICE-ADMIRAL SIR FREDERICK W. E. NICOLSON, BART., C.B.,
Vice-President, in the Chair.

NAMES of MEMBERS who joined the Institution between the 1st and 18th
January, 1875.

LIFE.

Strange, Charles V., Lieut. R.N.
Betty, J. F., Major R.A.

ANNUAL.

Glover, Sir John H., G.C.M.G., Captain, R.N.	Pitcher, Duncan G., Captain Ben. Staff Corps.
Watson Henry W., Lieut. late R.E.	Polkinghorne, Stewart, Lieut. R.M.L.I.
Barrow, Charles T., Lieut. 26th Regt.	White, Chas. W., Lieut. West Kent Mil.
Preston, B. H., Major Madras Staff Corps.	Kinloch, Geo. A. H., Capt. 13th Regt.
Hogg, John R., Captain R.E.	Reid, Sylvester, Lieut. 11th Regt.

ON THE COMPARATIVE MERIT OF SIMPLE AND COMPOUND ENGINES.

By G. B. RENNIE, Esq., M.Inst.C.E.

HAVING been invited by the Council of this Institution to read a paper "On the comparative merit of simple and compound engines," I will endeavour to lay my views before you with as few technical expressions as possible. That such a subject cannot be treated altogether free of such terms, and as I expect that several members present here to-night are of the Navy, who have mostly a knowledge of the construction and management of the propelling machine on board a man-of-war, I trust your indulgence in allowing me the use of a few professional words.

It will *first* be advisable to understand what is meant by the terms simple and compound engines (those being the words given by your Secretary). As regards the "simple engine," it may be either taken as the simplest type of steam engine in ordinary use, such as with a single cylinder, without separate appliances for "cutting off" the steam to allow it to expand more than is due to the ordinary "cut off" made by the slide valve, and to discharge the steam so used direct into the

atmosphere; or it may be considered an improved form where the steam is expanded to its utmost by the use of separate expansion-valves, or by utilising the steam discharged by heating the feed water, or improving the draught of air in the furnace, by turning the discharged steam into the chimney by what is known as the "blast," or by condensing the discharged steam either by direct contact with cold water, or what is known as surface condensation, and finally taking advantage of the steam so condensed in creating a vacuum by the application of an air-pump to discharge the air and condensed steam. Though all these forms of engine, each of which is a gradual improvement on the efficiency of the machine, may be taken as the "simple" marine engine, yet I am inclined to think the latter, which may be considered as the most improved type of using the steam advantageously in a single cylinder, so as to get the greatest power out of a given quantity of evaporated water, is what would be most interesting to you to form a comparison with what is called the "compound" engine.

Secondly. The compound engine, in contradistinction to the ordinary or simple engine, has two or even more cylinders for using the same steam, that is, after the steam has done its duty in one cylinder, it is discharged into another, and in some few cases again into another, until the maximum effect is obtained out of the steam by its expansion.

The usual form of compound engine is to have only two cylinders in a complete machine, the two cranks being placed at right angles with each other, as with the "simple engine," but they are not unfrequently made with four cylinders, viz., one large and one small to each crank. The proportion of the large to the small cylinders in either system depends on the steam pressure used, the amount of its expansion, and whether especial mechanical arrangements are made for cutting off the steam by independent valves, or merely allowing the steam to expand, according to the relative volume of the two cylinders. The usual proportion is, however, three or four to one.

Examples of the first arrangement are the "Briton" and "Tenedos," similar ships of 350 nominal horse-power. The results of the trials of these two ships may be said to have commenced, the compound system being adopted in the Navy, though the "Sirius" and "Spartan," of similar horses' power, had been tried some time previously. These two are of the second type of compound engine above described, each crank having a large and a small cylinder working on it.

The results of the "Briton's" trials are published in the "Transactions of the Society of Naval Architects," from a paper I read at a meeting of the Society held in March, 1871 (Appendix A). The consumption of coal at full power was slightly under 2 lbs. per indicated horse-power per hour, the best result being obtained when working about half power, when only $1\frac{1}{2}$ lbs. was burnt per indicated horse-power. A nearly similar result when working full power was obtained with the compound engine for driving the new pumping machinery at Chatham Dockyard. Arrangements were made for measuring all the steam used in the engines by discharging it, after it was condensed into water, into two tanks. The power by the indicator was taken every

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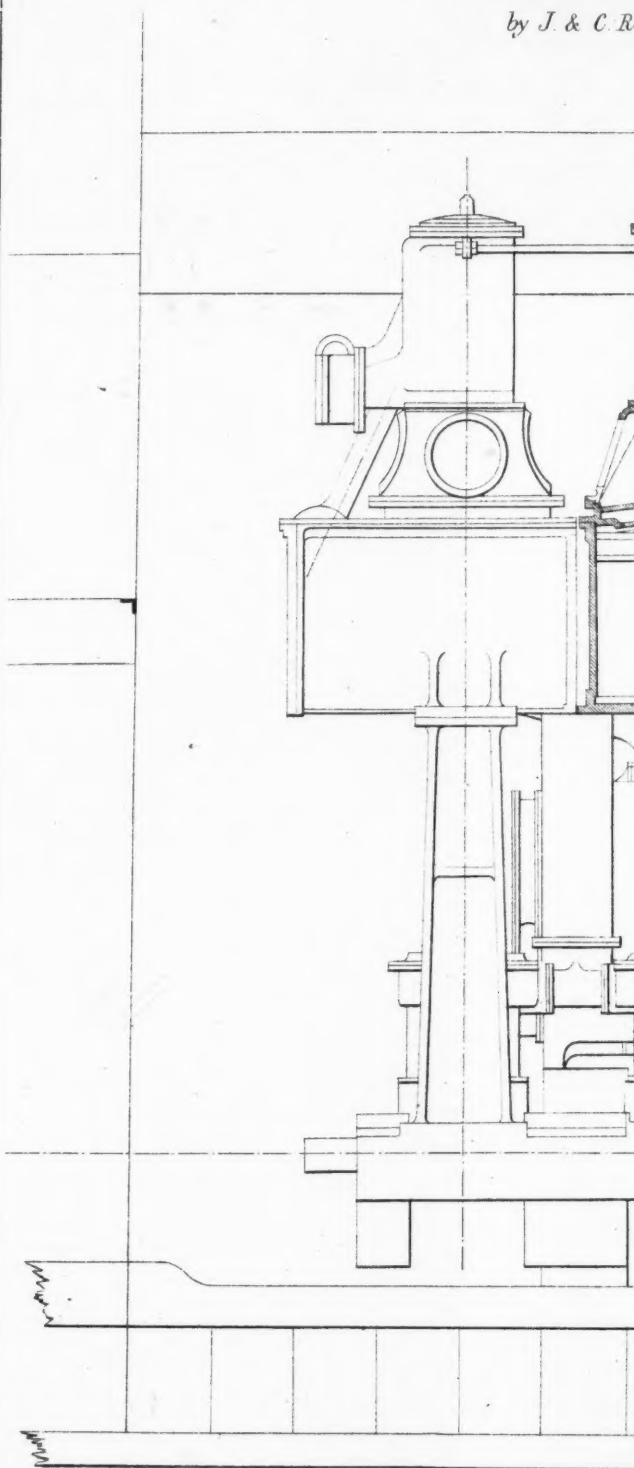
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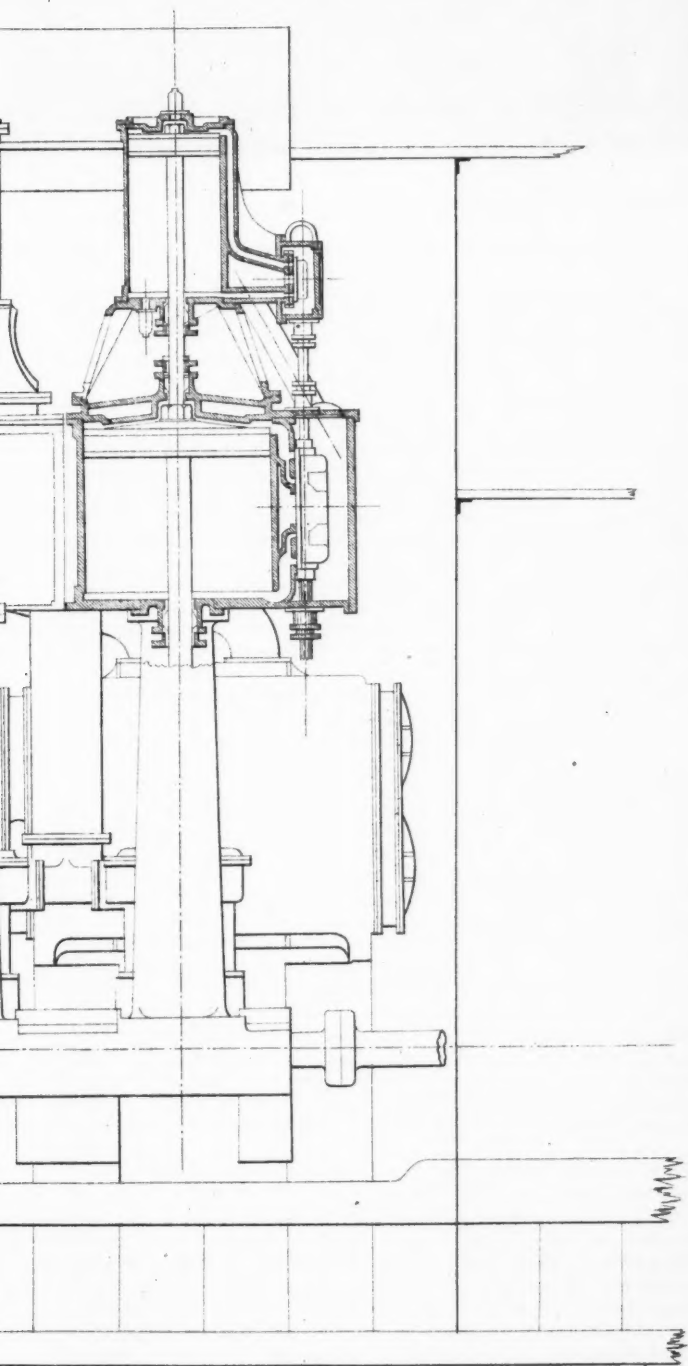
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ten minutes. The total time of working the engines was a little over $3\frac{1}{2}$ hours, and it was found that 18.92 lbs. of water were used in the shape of steam per indicated horse-power per hour; and as the coal used, viz., "Fothergill's Aberdare," has, according to Admiralty experiments, an evaporative power of 9.73 lbs. of water per lb. of coal, this would give (taking the steam used as the basis of calculation) a little under 2 lbs. of coal per indicated horse-power per hour.

I have here a table of the comparative consumption of coal of different kinds of engines. This comparison was made a few years ago, and from further observations I think it is, on the whole, a pretty fair one (Appendix B).

There may be many engines of each kind which may consume more or less than stated; but supposing them to be all under the same usual conditions, both as to manufacture, kind of coal, and other circumstances, I believe it is not far from correct.

Since this table was made out, I have had a most satisfactory opportunity of comparing the results of the coal consumed between the ordinary or simple injection engine working with 25 lbs. steam in the boilers, and the same engine, after being compounded, working with about 55 lbs. steam in the boilers.

The "Minia" was a screw steamer of 200 nominal horse-power. The cylinders were 54 inches diameter, with a stroke of 3 feet 4 inches. The number of revolutions of the screw propeller was about 60 per minute. The engines were the ordinary overhead construction, with injection condensers and boilers for working with 25 lbs. steam pressure. The average consumption of coal was at the rate of 33 tons per 24 hours, with a maximum consumption at full power of 45 tons per diem. The engines were "compounded" by my firm, by placing small cylinders of 27 inches diameter on the top of the existing cylinders. A surface condenser was also added, and one of the existing air-pumps was converted into a cold water circulating pump. Four new boilers, adapted for 60 lbs. working pressure, were also supplied. The rest of the engine, including the screw-propeller, remained as before, and the result has been that the average consumption at sea has been reduced to 17 tons per diem (equal to about $2\frac{1}{4}$ per indicated horse-power), with a maximum consumption of 24 tons when working full power, and the revolutions of the screw propeller, and consequent speed of ship, has been slightly increased. That is, the coal consumption has been reduced nearly one-half since the engines have been "compounded."

I may also cite another example of the comparison between the ordinary injection engine and a new compound engine which had been substituted for it. The "Pera," a screw vessel belonging to the Peninsular and Oriental Company, had formerly vertical geared engines of the injection type, which were considered very economical in their day.

The nominal power was 450 horses, and gave an average yearly speed of 10.4 knots per hour, with a consumption of 43 tons per diem. New engines were placed on board, of the compound type, and the ship ran from Brindisi to Alexandria, with the Indian mails, making an average

somewhat over $10\frac{1}{2}$ knots, with an average consumption of about 24 tons of coal per diem. This is an example where both engines are by the same makers, with equally good manufacture, and the same engineer management on board, and the ship navigating the same seas.

As an instance what can be done in making a long sea voyage entirely under steam, with a small-sized ship with compound engines, I may mention that of a dredging vessel of 160 feet in length, and 28 feet beam, fitted with twin screws and compound engines of 70 nominal horse-power, having made the voyage from London to Buenos Ayres in 46 days, stopping only once, namely at Madeira, to fill up with coal; that she steamed a distance of about 5,000 miles, between Madeira and Buenos Ayres, in 36 days, without taking in fresh coal. Had the ship had the old class of engines, she would have been obliged to have made the voyage under canvas, or to stop at intermediate ports to take in coal.

It will be understood that such a radical change in the propelling machine of a ship, enabling her to be steamed nearly double the distance with the same weight of fuel, is so important in its effects on ocean steam navigation, that one can hardly be surprised at the demand there has been in the mercantile world for ship engines of the new type; but the increased number of steamers and accelerated trade thereby, so increased the demand for coal, which was not supplied in the same rapid rates as the ships and engines, and so augmented the price of it, that the money equivalent from the reduced amount of coal used in each ship has not been realised to what was expected, and has unfortunately now caused a considerable stagnation in the shipping trade.

The improved result in point of consumption of coal of the compound engine over the old type engine, is not due entirely to making the steam do duty in two cylinders instead of one, but to the different conditions in which the steam is used, viz., to the greater boiler and initial pressure used in the cylinders, and to expanding it to a much greater extent than formerly, in order to get the full duty out of it. The question of the relative advantage of expanding steam in one cylinder or two has been a controverted one with engineers for many years, especially as regards land engines, where the higher pressures had been more frequently used; but I think it is now pretty well agreed on all sides by those who have studied the subject, that where the pressure of steam, amount of expansion of same temperature, and dryness being also alike, and with equally good manufacture and superintendence, that the fuel consumed per indicated horse-power, is practically identical in both systems.¹

¹ That is, when the pistons are of so good a construction as to be practically tight; but should that not be the case (which is not uncommon) I think it highly probable that with the simple engine, with 60 or 70 lbs. on one side of the piston and a vacuum on the other, a much larger consumption of steam and coal will take place than with the compound cylinders, where the pressure is at the boiler pressure on one side of the piston, and some 5 or 10 lbs. above atmospheric pressure on the other; moreover, should any leakage of steam take place by the high-pressure piston, it will have a chance of being used in the low-pressure cylinder before being discharged into the condenser.

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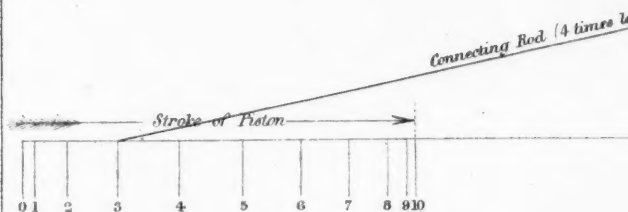
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Diagram shewing how the Tan

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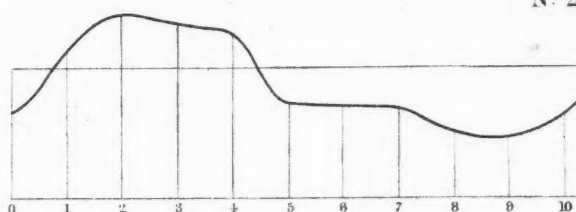


The actual pressures on the piston, here taken at each successive point in a and resolved in the line of the tangent, at the circle at the corresponding of the crank as shown by the arrow A.

Compound Eng

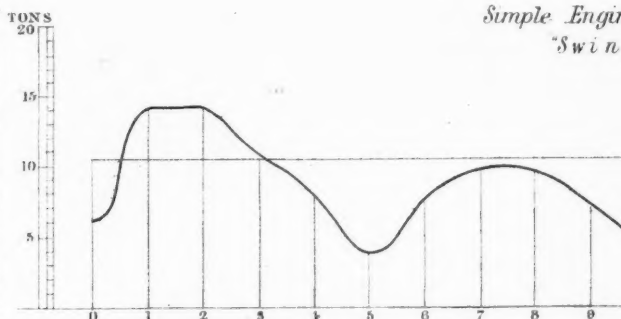
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N^o 2



Simple Engi

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The above numbers correspond with those of diagram N^o 1. The pressure each successive point of the circumference, acting at a tangent to the C average at each point, to turn the shaft and Screwpropeller round.

H.M.S. "B

Mean Pressur

Fig. 3.

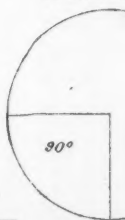
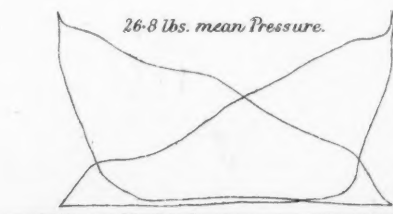
acting at a Tangent of Circ

Max: 60 Tons.



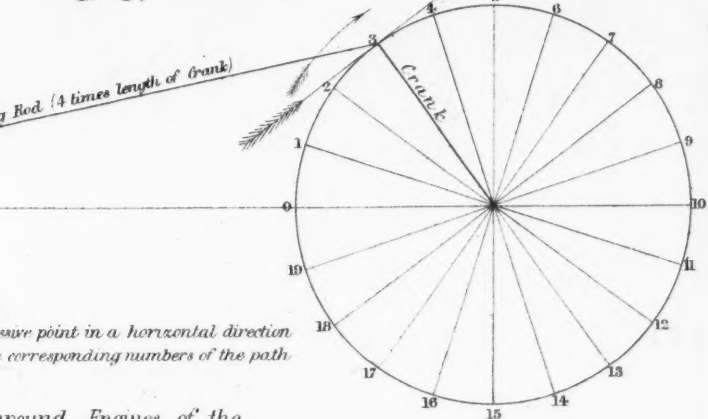
95 Revolu

26.8 lbs. mean Pressure.



how the Tangential pressures are calculated

N° 1.

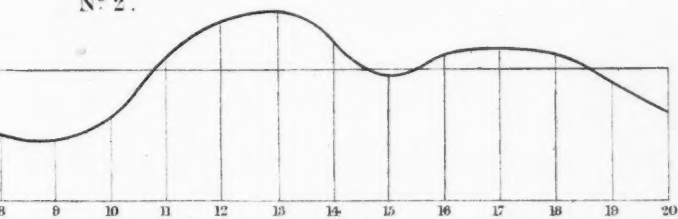


... point in a horizontal direction
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Compound Engines of the

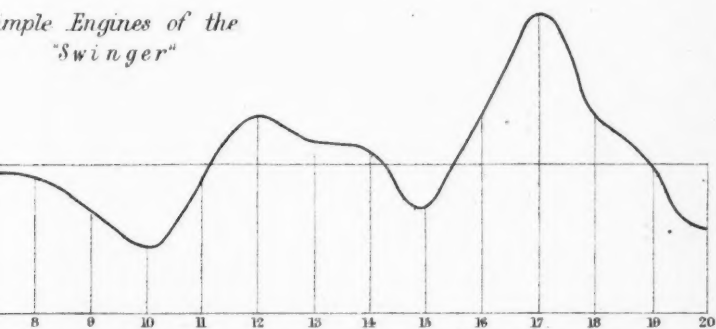
"G o s h a w k"

N° 2.



Simple Engines of the

"Swinger"



1. The pressures given are the combined pressures in Tons of the two Cylinders at
tangent to the Circle at that point, and indicates the actual force exerted on the
roller round.

H.M.S. "Briton"

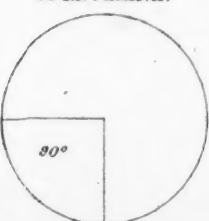
Mean Pressure 39 Tons.

... of Circle of 1 ft. $4\frac{1}{2}$ in. radius.

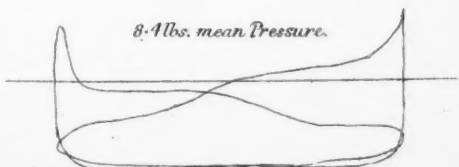
60 Tons. || Min. 28 Tons.



95 Revolutions.



8.4 lbs. mean Pressure.



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We have adopted the compound engines for many years; in 1842 we supplied them for Messrs. Cubitt and Sons', London Dock pumping engines, Royal Arsenal, and many others. The engines on this plan are usually called "double cylinder beam engines," and work with about 60 lbs. in the boilers; our preference for this engine being that the strains were more uniform and less severe, and the rotatory motion more equal. The consumption of coal I find in referring to some old examples, was about $2\frac{1}{4}$ lbs. per indicated horse-power, or about the same that is realised in a good compound engine.

It is always a difficult matter to get good examples of a fair comparison between two classes of engines, but as regards land engines, I may quote the trials between the simple and compound engines made at the New River Waterworks Company, where, I believe, as far as consumption of coal was concerned, there was practically no difference in the two systems. As regards marine engines, the comparative trials between the "Goshawk" compound and "Swinger" simple, with two cylinders of equal size, will be in the recollection of many, but it may be well to state the leading particulars. These two vessels were of like tonnage and horse-power, the trials were of six hours' duration, and took place at the same time and place. The average power of the "compound" was 374.2 horses, at a consumption of 2.6 lbs., and the "simple" was 364 horses, at 2.61 lbs. per square inch. After the trials to test the coal were completed, the speed of each vessel was ascertained on the measured mile, which showed the "compound" vessel to be making 10.419 knots, whilst the "simple" only made 10.14 knots. The greater speed of the former may probably be due in part to a slight excess of engine power; but I am inclined to think that more is due to the more uniform distribution of the power round the path of the crank, and that that machine which gave the more steady and uniform motion to the propeller, pushed the ship the fastest through the water.

I have made two diagrams (Plate V) showing the pressures in tons at right angles to the cranks (tangential pressure), at 20 equally divided points in the circumference of the circle of 9 in. radius (Fig. 2). These pressures are calculated from copies of diagrams taken on the trials, the length of the connecting rods being also taken into account to get the true pressures at each successive point of the path of the cranks. It will be observed that in the diagram of the "compound engine" the tangential pressures varies from 4.29 tons to 13.56 tons, or the highest is 3.1 times that of the lowest. In the "simple engine," it varies from 4.60 tons to 21.12 tons, or the highest is 4.59 times the lowest; and I am inclined to think that the greater speed of ship with the compound engine is due to there being less variation in the pressures throughout the revolution of the screw propeller.

The compound engines of the "Briton" I found to be even more uniform than those of the "Goshawk"; the pressures in that case varied from 7.91 tons to 17.16 tons, or the highest was only 2.1 times that of the lowest.

I believe the question of a uniform tangential force is of more importance than is often considered, both for propelling the ship, as well as for the less liability to rupture of the different working parts,

which rupture is more often due to suddenness and change of strain than to a constant steady pressure.

Taking the above named pressures in each class of engines, I found by keeping the shafts and other working parts of equivalent strength, which would probably give a total weight of somewhat under 5 per cent. for the pressures they had to sustain, that the simple engine was about one-tenth heavier than the compound engine, of course, irrespective of boilers, which would be common to both.

To show how important it is to take into consideration the tangential forces in the crank-path, I found, in making different calculations for finding the best position to place the cranks of the compound three cylinder engines of the "Boadicea" and "Bacchante," of 5,250 horsepower each (Plates VI and VII),¹ that if the cranks were placed at equal angles between them, the shaft should be 18 ins. diameter, but if placed with the two low-pressure cranks opposite to each other, and the high-pressure crank at right angles to them, that the shaft need not be more than 16 ins. to be of equal strength to transmit the same total power.

The *simple engine*, or engine with two cylinders of the same size, working with a pressure of from 60 to 70 lbs. direct on the pistons, has been tried in more than one Transatlantic Company. One of them had, I believe, four vessels with such engines, but it was eventually found necessary to reduce the pressures some 20 lbs per square inch in consequence of the crank-shafts continually breaking, but, according to the usual mode of calculating the strain on the shafts, they ought to have been amply strong enough for the intended pressures, and I can only account for it by the sudden and irregular strains on the shafts due to the high initial pressure and early "cut off."

It has been supposed by some that the weight of the screw propeller is sufficient to act as a fly-wheel to give an equitable rotative motion in propelling the ship; but I think that any one who has observed the working of a powerful engine on board ship must have seen that such is not the case: there is usually one part of the revolution of the shaft that appears to have greater power exerted through it, and it is felt in the motion of the ship. It has always appeared to me that I have felt less motion with the compound engine than with the old type.

One objection that has been used with reference to the compound engine is, that the low pressure cylinders in engines of great power become of so large a size as to render the castings excessively heavy, and that many of them have cracked after being in use. This difficulty is in a great measure obviated by making an inside liner of a separate piece from the body of the casting, and forming a space between them for a steam jacket, instead of casting the whole in one. The system of having two low-pressure cylinders to one high-pressure cylinder, as in the "Boadicea," or by having two low-pressure cylinders and two high-pressure cylinders, as in the "Minia" type, also prevents any objection on that score.

It has been sometimes asserted that the increased surface subject to radiation in the compound cylinders has tended to a loss of heat; but on

¹ The Institution is indebted to the Institution of Naval Architects for the originals of these plates and of Fig. 3, Plate V.

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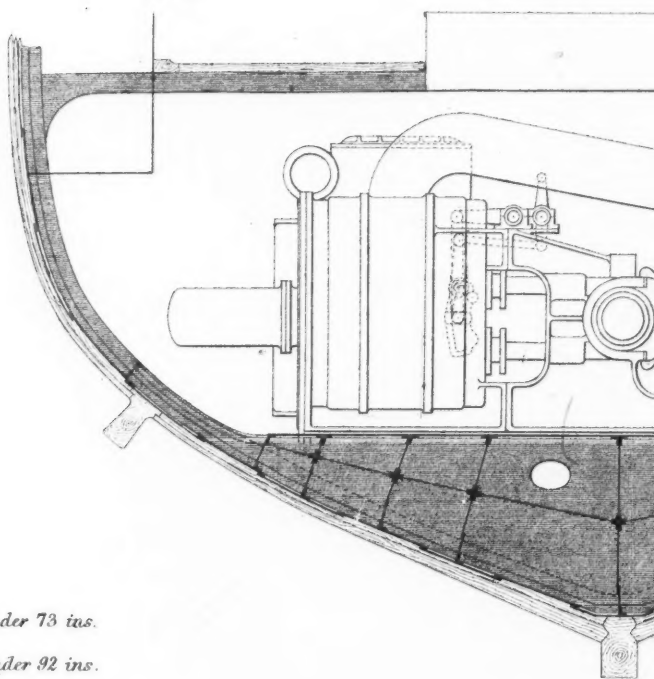
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To illustrate Mr. G. B. Rennie's Paper on Three-throw Crank Engine



Diam.^r of H. P. Cylinder 73 ins.

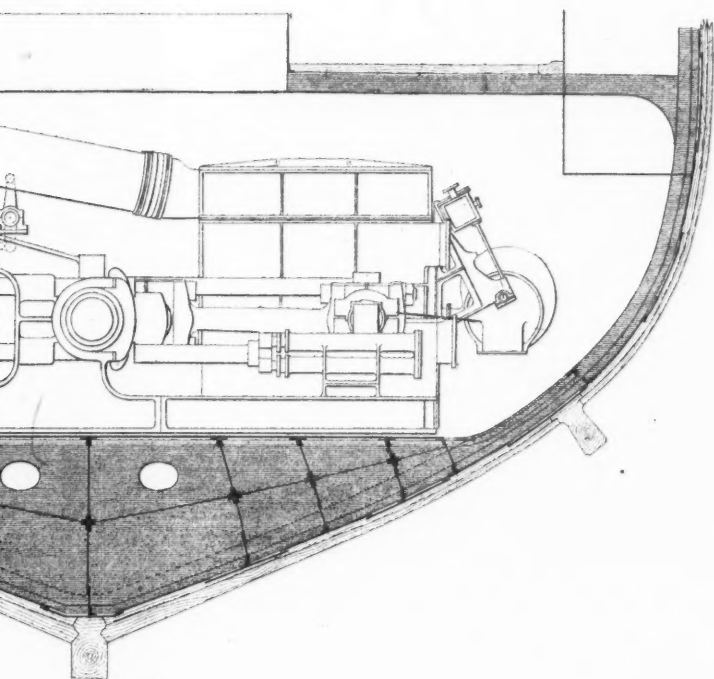
Diam.^r of L. P. Cylinder 92 ins.

Length of Stroke 4' 0"

Compound Engines of 5250 Im

by J. & G. Ren

Rankine Engines, of the Compound System H.M.S. Boadicea and Bacchante.



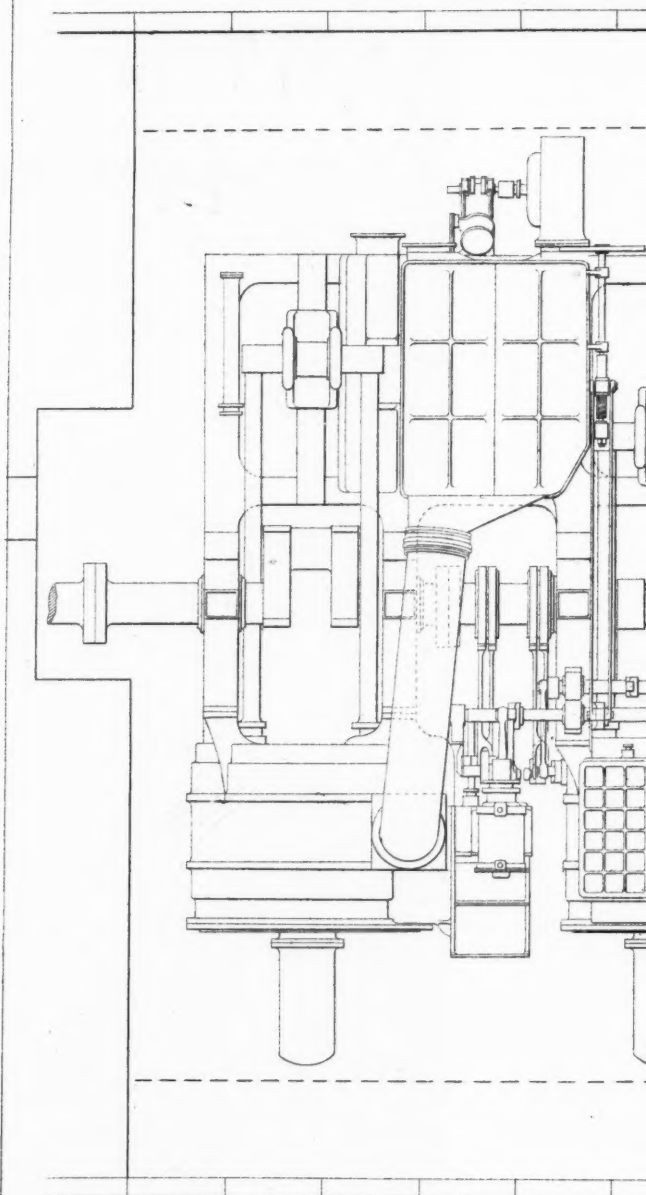
of 5250 Indicated Horses Power,

J. & G. Rennie, 1874.

To illustrate M. G. B. Rennie's Paper on Three-throw Crank Engine

Compound Engines of 5250 In

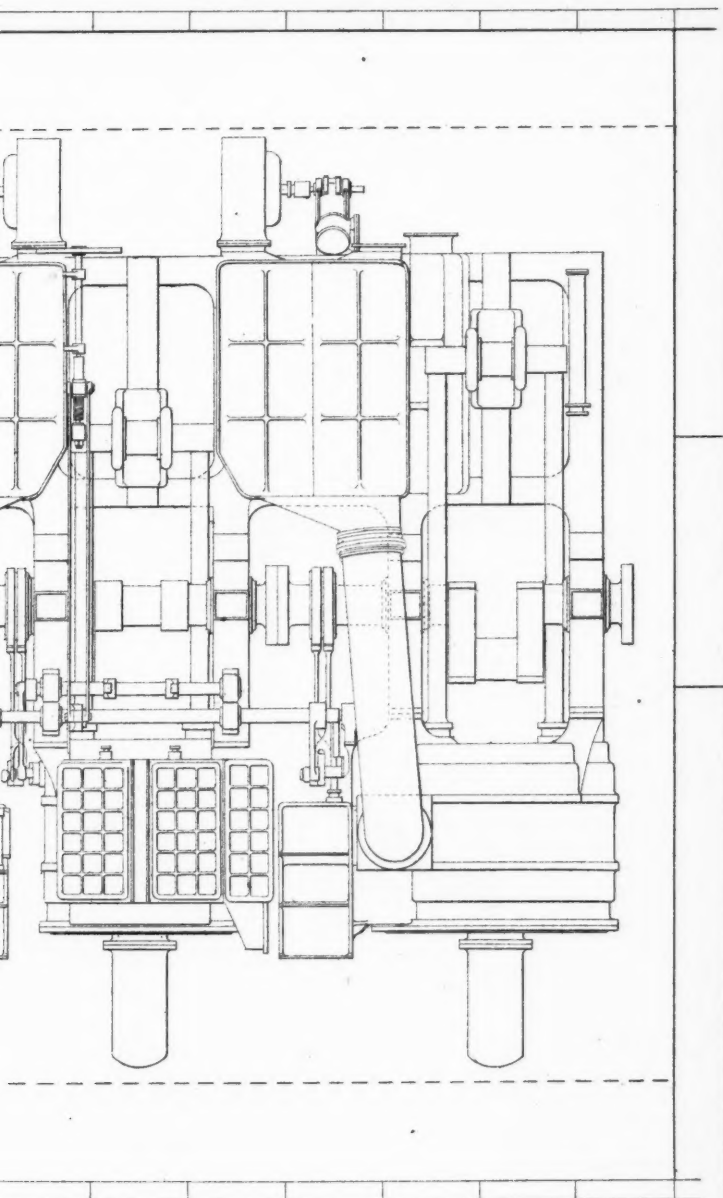
by J. & G. Ren



Rankine Engines of the Compound System, H.M.S. Boadicea and Bacchante.

of 5250 Indicated Horse Power,

J. & G. Rennie, 1874.



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the other hand it must be remembered that the increased size also gives an increased surface of steam jacketing to warm up the steam inside the cylinder.

Some interesting particulars have lately been published with reference to the trials made with the engines of the United States' Coast Survey steamer "Bache." These seem to have been made with and without a steam jacket on the compound cylinders compared with the same pressure of steam (80 lbs. per square inch), used in a single cylinder alone, also with and without the steam jacket. The high-pressure cylinder was about 16 inches diameter, and the low-pressure 25 inches, stroke in both being 2 feet. The results, *without steam* in the jackets when working as a compound engine, appear to indicate that there is not any material difference in the consumption of steam and coal per indicated horse-power by using the different grades of expansion, which varied from 5·6 to 9·14 times total expansion, with a consumption of coal only varying from 2·54 lbs. to 2·6 lbs. per indicated horse-power per hour. Whereas when the single large cylinder alone was used without the steam jacket admitting the steam pressure of the boiler, viz., 80 lbs. per square inch, direct on to the piston and "cutting off" by means of an independent valve, the consumption per indicated horse-power appears to increase when the expansion of the steam is greater, that is, with a ratio of expansion varying from 5·3 to 11·8 times. The coal per indicated horse-power varies from 2·874 lbs. to 3·84 lbs.; but when steam was admitted into the jackets (and selecting two trials from each series of experiments which more favourably compare), the compound cylinders had a ratio of expansion of steam of 5·7 and 9·19, with a corresponding consumption of coal of 2·23 and 2·26 lbs. respectively, and with the single with steam in the jacket with an expansion of 5·1 and 8·57 times and a consumption of 2·53 and 2·638 respectively, that is, the result is rather in favour of the compound engine in point of consumption of steam and coal. That this is due to any advantage of expanding the steam in two cylinders instead of in one I am not inclined to think, but probably to some difference in the vacuum, coal, or stoking, besides the slight difference in the expansion, or to leakage of steam by the piston.

The initial pressure on the large piston, after the steam has done its duty in the small one, is given as 18·99 lbs. (say 20 lbs.), but when the steam is acting direct on the large piston for working on the simple plan, then the initial pressure is as high as 90·14 lbs. (say 90 lbs.), the average revolutions in the first case being 48 and the second $46\frac{1}{2}$, the horse-power being 77·45 and 74·6 respectively.

It may therefore be said with the same horse-power and same number of revolutions that the total pressure on the compound cylinder would be 1 and on the simple cylinder $4\frac{1}{2}$; but supposing—to fairly represent the difference—there were two cylinders of half the size to compare with the two cylinders of the compound engine, the proportion of the pressures would be as $2\frac{1}{4}$ to one, and the working parts would have to be increased at least in corresponding proportion to be of equal strength to the parts of the compound engine.

In actual practice in marine engines, it may happen that the smaller

diameter of the "simple engine" may be still further reduced, in consequence of the form of the ship admitting of the cylinders being placed more in the wing, which may still further enable the diameters to be reduced and the stroke increased in proportion.

It seems to me that the compound engine must be looked on in the light of a most convenient mechanical arrangement for working with a high pressure of steam and great expansion; and should very much higher pressures than 60 or 70 lbs. per square inch come into use—and I believe it has been proposed to make some engines for the navy for working with from 250 lbs. to 300 lbs. pressures—it seems to me that some system of compound must of necessity be adopted, and that with three or more cylinders in lieu of two, as is now usual.

The following, I therefore think, may be the summary of the comparative merit of the simple and compound engine:—

1st. With equal amount of pressures, expansion, dryness of steam, the coal consumed will be practically identical in both systems, supposing the pistons tight.

2nd. When equal power is obtained, the working parts of the simple engine will have to be heavier than the compound.

3rd. The strains on the compound engine being more uniform, there will be less liability to fracture in the working parts.

4th. The simple engine with two cylinders of the same size will have the advantage of having fewer pieces of spare gear to stow away.

5th. The simple engine having each cylinder independent of the other can be more readily worked with one engine than with the compound engine, should one engine be disabled.

6th. For the same power of engine, it is probable that a greater speed of ship may be obtained with the compound engine than with the simple engine.

7th. If much higher boiler-pressures come into use than are now usually worked, the compound engine will have to be exclusively adopted, on account of the better mechanical arrangements which can be made for working with a high degree of expansion.

APPENDICES.

(A.)

Particulars taken from the Reports of the Official Trials of the Compound Engines of H.M.S. "Briton" for six hours' steaming.

Date of Trial.	Mean speed of ship in knots.	Pressure of steam in engine room.	Revolutions per minute.	Indicated horse-power.	Coal per horse-power per hour.	Time of steaming with 240 tons.
2nd June	12·767	51·91	92·649	2,018·3	1·98	5½ days
10th June.....	10·026	50·00	67·308	660·58	1·3	26 "

(B.)

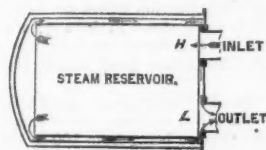
Comparative Consumption of Coal of different Types of Engines.

Type of Engine.	Per H.P. per hour.	Tons per diem.	Days and hours steaming with 240 tons of coal.	
			Days.	Hours.
1. Improved compound	2½	48	5	0
2. Ordinary type with surface condensers and superheaters	3½	75	3	4
3. Ordinary injection	4½	97	2	11
4. High pressure	6	129	1	21

The CHAIRMAN : I understand there are several gentlemen here who have given much attention to this subject. We shall be happy to hear any observations they have to make.

Mr. COWPER : I do not wish to occupy much time, as I think Mr. Rennie has already explained the principle of compound engines very thoroughly; but I suppose I must take some little of the credit of the "Briton," seeing she is under my patent by the arrangements of the reservoir for the steam. Of course, in a paper like this, it is impossible to go fully into the details. I may, perhaps, explain the arrangement

COWPER'S ARRANGEMENT.



of the reservoir, which is that of a steam-jacketed vessel with high-pressure steam from the boiler in the jacket, and so far is the same plan that I introduced many years ago, but my particular arrangement of the reservoir as in the "Briton" is peculiar. There is first the steam-jacket round the outside of the reservoir, but the steam from the high-pressure engine passes into the interior of a hollow vessel or lining inside the reservoir, so that when the steam goes from the high-pressure cylinder where it has been partly expanded, it goes into the reservoir at "H," but when it comes out, it does not come out from the same pipe, but from behind the closed end of the internal lining; so that the steam has to pass all along in a thin film about as thick as your hand, between the internal lining and the steam-jacket out at the pipe "L," and so gets warmed up. Therefore, without any valves, the steam is caused to pass into the reservoir and is not then superheated, but it is superheated before reaching the low-pressure cylinder. You have, thus, an opportunity of warming up the steam during expansion, and I believe it is owing to that, that so low a consumption as 1.3 lbs. of coal per horse-power per hour has been obtained with the "Briton" at a 10-knot speed. It is the lowest consumption that has ever been obtained. I quite agree with Mr. Rennie in reference to placing the cranks at right angles, and I am glad to see he has so carefully gone into the question of the com-

parative amounts of rotative power, when two low-pressure cylinders of moderate size are used, instead of a large one, to work with one high-pressure cylinder with its crank at right angles to them. It was owing to my having investigated the rotative power, &c., very thoroughly before 1862, that caused me to advocate the cranks being placed at right angles. The various rotative powers are very strongly shown by the diagrams I then made, as below :—

FIG. 1.

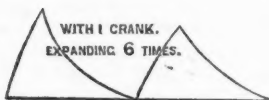


FIG. 2.

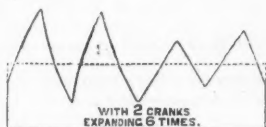


FIG. 3.

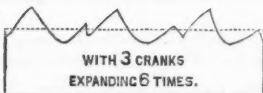


FIG. 4.



Fig. 1 shows the diagram of rotative power which is produced by using steam cut off at a quarter-stroke in one cylinder, the variation being from 100 to 0. To obtain good indicator figures, an expansion valve is required.

Fig. 2 shows that produced by using steam cut off at a quarter-stroke in two cylinders, the cranks being at 90° , and the variation being from 100 to 35. To obtain good indicator figures, two expansion valves are required.

Fig. 3 shows that produced by using steam in three cylinders cut off at a quarter-stroke in each, the cranks of the 3-throw crank shaft being placed at 120° . The variation is from 100 to 70. To obtain good indicator figures, three expansion valves are required.

Fig. 4 shows the figure produced by using steam cut off at nearly half-stroke in each of two cylinders in the above described uniform power expansion engine, the cranks being at 90° as usual, and the variation being from 100 to $77\frac{1}{2}$. No expansion valves are required to produce good indicator figures on this plan.

I may mention, if you do not require quite so much expansion as the figures from the "Briton" show, the rotative power can be much more uniform, in fact you can reduce it to about $22\frac{1}{2}$ per cent. variation in rotative power, if the two cranks are put at right angles and the steam cut off at very nearly half-stroke. If we wish to get the greatest uniformity of power, that is the way to do it; and it is far more regular than three cranks placed at other positions; two cranks placed at right angles is very much better than three cranks placed at 120 degrees apart. At the same time it is very convenient if you cut off at half-stroke in a cylinder for driving a blast-engine where the power required at the commencement of the stroke is nothing. It is clear a high-pressure expansion figure, expanding very considerably in one cylinder, does not fit at all to the power required in the blast cylinder, because the power is reversed. When it has expanded down to a very low pressure in the steam cylinder there is scarcely any power at the end of the stroke to finish the stroke of the blast cylinder which requires full power. In pumping engines you require a little more power at the commencement of the stroke, and towards the end of the stroke you require a little less on account of the momentum of the water and all the parts. So that you can expand in one cylinder by cutting off at half-stroke, and do the same in the other, and make both figures very nicely fit the power required in the pump. Then you can obtain a large amount of expansion by having

two cylinders to do it, first a high pressure, and then a low pressure, you thus get a large amount of total expansion.

MR. BRAMWELL, C.E., F.R.S.: I do not know that I can make observations of any use in this matter. Let me say, however, that I am very glad to hear the spirit in which this paper is written, that is to say, a spirit that leaves the question between simple and compound engines perfectly open, so that a man whether making a compound or a simple engine may still be within good engineering. I am very glad that Mr. Rennie, after all his experience, puts the compound engine no higher. It is very difficult to say to what the preference for the compound engine is due, but I will suggest two causes to which it may be attributable. The first advantage of the compound engines is that they practically inaugurated the working of high-pressure steam in marine engines, and the other is that they put it out of the power of the British workman to spoil the action of the machine in his charge. If you give him a single cylinder expansive engine the steam gets a little bit low, and he finds he can get more strokes by giving less expansion. This he does; but, like a man taking to dram-drinking, he incurs future harm to obtain immediate relief. When such a man has a compound engine he cannot do away with his expansion, and I really believe the great secret of the economy of compound engines arises from the fact that by their use it is no longer in the power of an ignorant man to do harm, to improperly work the machine entrusted to his charge.

I have, in vain, endeavoured to appreciate the great importance of the uniformity of tangential forces which has been treated of for such a purpose as driving a screw propeller. I quite admit when you are driving a cotton mill, and from 25 revolutions a minute of the engine, you have to get up your speed for the spindles of a mule to 7,000 a minute, it is most important that the uniformity of the rotation crank shaft should be as near perfection as possible. If it be not, any little undulation is magnified so much that you feel the ill-effects of it in your spinning; but in screw propulsion I cannot think it so important, and I will give instances to show that it cannot be.

We have screw vessels doing excellent duty, I won't say equal to the "Briton," but still excellent duty, with only a single engine—vessels of a large power with a compound engine it is true, but with the high-pressure cylinder over the low-pressure cylinder, both pistons attached to one rod and acting upon one crank. In these cases the difference of tangential force is from nothing at the end of the stroke to probably the greatest amount somewhere before the middle of the stroke is reached; therefore the variations must be greater than anything we have heard in the instance of the "Swinger" with its pair of single cylinder expansion-engines at right angles; but if there were an importance really belonging to uniformity of tangential force for propulsion, single engines ought to work most discreditably. But they do not do so in these large screw steamers, neither do they with paddle wheels. Our American friends with paddle engines have done for years past upon their rivers, things we have never been capable of doing, and uniformly those are single engines, and slow-going engines running only 14 or 15 revolutions a minute, and it is well known these give excellent results. Therefore I say I do not think there can, as a mere propelling agent, be that value in absolute uniformity which some persons, especially my friend Mr. Cowper, attribute to it, and which Mr. Rennie is quite inclined to attribute to it, because in its absence he cannot account for the difference of some three-tenths of a knot which was observed in the speeds of the two which he has instanced.

Supposing uniformity of tangential force be not of value for working a propelling agent, is it of value as regards the endurance of the engines themselves? I am inclined to think uniformity of strain in the engine itself might be of value, but there is no necessary connection between uniformity of the tangential force of a pair of engines and uniformity of strain on the parts of those engines; because, recollect those figures we have here are the aggregate of the results of the two engines when considered in relation to one crank path; but in each engine, considered alone, there is not that uniformity, but there is the variation between the pressure of the initial steam and that at which it leaves the cylinder, and therefore, the piston-rod, connecting-rod, and crank-pin, so far as regards the up-and-down motion, are all of them affected by the conduct of the steam in the high-pressure cylinder in the same way as they would be if the steam were not afterwards used in another cylinder.

Thus, you must not think that you are getting a uniformity of strain in each engine itself—that clearly is not so; therefore it seems to me, unless it can be established that there is a necessity upon propelling agents to run with that absolute uniformity, you fail to show that there is any great good to be got out of it for the purposes of propulsion. But it certainly does require very many counterbalancing advantages to induce one to do this fact, an inherent defect, in compound engines, which is not appreciated by those who do not make engineering a profession. Most persons, not as engineers, who consider the compound engine, are in the habit of thinking the two cylinders give an aggregate cubical capacity for working effect. Suppose, for example, you have a 50-inch high-pressure cylinder, and 100-inch low pressure cylinder, they fancy you get an effect due to the combined area of these cylinders, or 12,500 circular inches, the area of the two pistons. But those who make engines know very well no more is got out of those two cylinders than would be obtained out of the 100-inch cylinder, only with the steam expanded to the same degree; and that, therefore, the 50-inch cylinder is so much absolute waste as regards producing power. I may be told practically you cannot obtain your power in the single cylinder, that it would not bear the expansion, and that no doubt is the reason why the compound engine is used, coupled with the other reason that the men cannot derange it.

Having said this much, which shows that, if Mr. Rennie will let me say so, I, like him, am in the most undetermined state about the question for ocean steamers; I may, however, say, this is quite certain, that I should not recommend a compound engine for a short channel voyage.

I was very much surprised to hear Mr. Rennie state, that a compound engine is lighter, per horse-power, than the single expansive. One gets into very large dimensions with the low-pressure cylinder, and although the strains are not so great per inch, there is a necessity for very heavy weights, and a case has come under my notice where the advantages expected from compound engines in a steamer, to cross St. George's Channel, have been frustrated, because they have put the boats down ten inches lower, owing to the increased weight of the machinery.

I wish to challenge that table of Mr. Rennie's in one particular. I think I have heard him say before where he got it from, and I want, having had something to do with one of the cases cited in it, to challenge it. Mr. Rennie puts high-pressure engines, per horse-power per hour, at 6 lbs. I think I am right in saying, you got that from the average performance of the engines at the trials of the Royal Agricultural Society.

Mr. RENNIE: No, I got that from the returns of the Government high-pressure engines.

Mr. BRAMWELL: Take the case of a locomotive engine. You will get a horse-power out of those engines certainly for $3\frac{1}{2}$ lbs. with 140 lbs. of steam on; and it is equally certain, when high-pressure engines, working 80 lbs. of steam only, are doing their best on trial, you can get them down to a little under $2\frac{1}{2}$ lbs. per gross indicated horse-power per hour.

I wish I could get somebody to trust me, and to risk a few thousand pounds. I should uncommonly like to see, instead of these enormous machines in the steam-boat, something of the locomotive type put in, and geared up by frictional gearing with a piston running 800 feet a minute instead of three or four. When we recollect that we really have had high-pressure engines developing an indicated horse-power to every 56 lbs. weight, including the water in the boilers, the boiler, the propeller, the shaft of propeller; and when we recollect that compound marine engines are not made very much under 4 cwt.; when we recollect the weights are eight to one,—it does seem to me that the man would deserve well of his country who would risk a few thousand pounds. If he succeeded, he would be lauded; if he failed, he would no doubt be called a stupid fellow; but I wish some patriotic individual present to-night would be inclined to make the trial under my auspices.

Mr. PERKINS: I think Mr. Bramwell is rather wrong in saying a compound engine ought to weigh 4 cwt. per horse-power; I think it ought to be done easily for two.

Mr. BRAMWELL: I do not say it ought; I only say what it does.

Mr. PERKINS: I think it has been done for 2 cwt. I have done it for 2 cwt., so

that I do not think it ought to be taken as 4 cwt. I think there are a great many done as low as 3 cwt.

Mr. WRIGHT: Mr. Rennie, as a successful maker both of simple and of compound engines, is of course entitled to speak with authority on the subject. I think, however, he has rather understated the case in favour of the compound engine as regards vessels of commerce, and perhaps he has slightly overstated it as regards vessels of war. As regards vessels of commerce, there have been some very good examples lately both of the compound and direct expansion engine at equal pressures. The last one I heard of was in a large ship running between Liverpool and America. The engines were 500 horse-power nominal, probably working to 2,000 indicated horse-power. After working ten or twelve months, I believe the results have been so bad that the engines are to be compounded. They were fitted up in the very best possible way. First, some parts of the engine gave way, such as the air-pump rods, and at last the crank shaft gave way, and in running, the noise and knocking was so great that the passengers were kept in a constant state of alarm. I have also heard of some other cases where the results have been most unfavourable, and I may mention on the last two or three occasions the Admiralty, in calling for tenders for engines, requested engineers, at the same time, to send in designs and tenders for simple expansive engines for the same pressure as the compound engines were to work at. A large firm on the Clyde, who had made direct expansion engines, stated, that their experience of them was so bad that they could not undertake the responsibility of tendering for them. I think, therefore, though Mr. Bramwell is rather strong on the point as regards vessels of commerce, a compound engine must be considered the best engine to be used. As regards vessels of war, one of the strongest objections made to the compound engine is this, that if you want to reduce the pressure in your boilers considerably, you would have a much greater falling off in power in the compound than in direct expansion engines. This is no doubt true, but the objection is made on the assumption that, as a matter of course, commanding officers would, in going into action, reduce the boiler pressure very considerably, with the view of obviating disastrous results, if a fracture occurred in the boiler, steam pipes, or part of the engine, to allow the steam to escape. In armour-plated ships the machinery is well protected; in unarmoured vessels, in all cases, the engines and boilers are to a greater or less extent under the water-line, and I should rather think that commanding officers would be inclined to retain the full power of the engines and the full speed of the vessels rather than to sacrifice a considerable amount of speed by lowering the pressure. This, however, is a question which the naval members of this Institution will be best able to give an opinion upon.

There is another point which Mr. Rennie has not noticed. He quotes a table, showing the comparative consumption of the compound engines, and the ordinary type which immediately preceded it. I believe these results are very nearly correct, and if you take an average probably the compound engine is 30 per cent. more economical than the engines that immediately preceded it, such as those in the "Devastation" or the "Hercules." He has omitted one part in the calculation, and that is the weight of the compound engine as compared with the simple engine which immediately preceded it. We find from a great many examples the compound engine is from 10 to 15 per cent. heavier than the simple engine. In vessels of war, the weights that can be carried are limited; in fact, it is a very great struggle constantly with regard to weights. In considering the best engines for a vessel of war you must take the aggregate weight of engines and coal; but if you take 10 or 15 per cent. as the difference between the compound and the ordinary engine, you must take an equivalent amount from the coal-storage, and, taking about an average of the quantity of coal carried in vessels of war, it will reduce the time which a vessel can keep the sea, or the distance she can run, to something about 20 per cent. in favour of the compound engine, instead of 30 per cent.

As regards the future, I may mention that instead of going to large examples of direct expansion engines, the Admiralty have commenced rather at the lower end with the engines of the "Swinger," 360 initial horse-power, and may probably gradually work upwards. At the present time, two sets of engines have been ordered, direct expansion, to work up to an indicated horse-power of 900. There are a

number of engines in similar vessels of the compound type, and one set also has been ordered on Mr. Perkins' plan for vessels of the same type, and I hope that if time will permit, we shall be able to get some very good trials to show the relative merits of these three kinds of engines.

With regard to the policy of having so many compound engines for the Navy, I may mention that the large committee on designs of ships appointed by the Admiralty two or three years ago, very strongly recommended the general adoption of compound engines for vessels of war. I also saw, a few days ago, a report from America showing that the American Government had appointed a committee of officers to report on a number of engines in store at the several dockyards, and the conclusions the officers came to, were to recommend the general conversion of these engines into compound engines and to appropriate them as opportunities occur to vessels of war: I think there were something like 16 or 18 engines altogether.

So far, therefore, as we can see at the present time, I think the compound engine, both for vessels of commerce and vessels of war, is the best type of engine we can adopt. We are gradually feeling our way to higher pressures, and if Mr. Perkins' engine turns out satisfactorily, as I hope it will, we shall make a very great step in advance, as regards pressure, of what we have yet done. We have had a great many difficulties in getting to the pressures we have arrived at, which perhaps the public out of doors, when they hear of mishaps occurring, do not make quite sufficient allowance for, but I hope as we gain experience, we shall be able to overcome those difficulties.

The CHAIRMAN: What is the high pressure?

Mr. WRIGHT: About 250 lbs. I presume. If he likes to go higher, say to 500 lbs., I do not suppose anybody will object.

Mr. BRAMWELL: I should like to ask Mr. Rennie whether in calculating those diagrams of tangential force any allowance has been made for the arresting momentum of the weight of the part at the termination of the stroke and the re-starting of the parts, or whether the parts have been taken as imponderable?

Mr. RENNIE: No allowance has been made: they are taken at the actual pressures of the piston.

Mr. BRAMWELL: If the weight of the part be taken into account it would very materially modify the tangential force.

Mr. COWPER: One word in explanation, in reference to the observations of Mr. Bramwell. I may mention that I did many years ago try all I could to expand eleven times in each cylinder of a pair, but the irregularity of motion was such, that it was an impracticable and an unengineering job. That was with one pair of engines under my own charge, and I did think I was going to prove I was right in expanding in one cylinder, but I convinced myself I was wrong, and I am glad to find Mr. Wright coincides with me in the practical conclusions arrived at. The uniformity is greater, the steadiness of the ship better,—most markedly so. It happened in the "Briton," we had exactly the same screw as another ship where the vibration was at least half as much again. I think there cannot be a shadow of doubt but that the uniformity of rotative power produced a uniformity of motion in the ship, and less strain.

Capt. SELWYN, R.N.: I think there are one or two points on which naval men may have something to say. I have always believed and said that there was much more in the daring to carry higher pressures in the boiler than in any particular form of engine adopted for the utilisation of those pressures, but still, having made some six voyages lately across the Atlantic in the largest Atlantic steamers, fitted with compound engines, I am bound to say, the compound engines have very great advantages, among which are certainly not uniformity of motion, because our engineering friends will do well to consider that one of the great evils at sea is the absolute impossibility of getting any uniformity of motion whatever. That which we have most to contend with, is the racing of engines, and until you can remedy that, it is utterly vain to give us a uniformity in smooth water, though it will be, no doubt, of the utmost value in a cotton mill where, as Mr. Bramwell says, the least undulation produces injurious results throughout the whole machinery. For the sea, efforts should be directed to the attainment of some controlling power over

the engines, when the screw is pitched clean out of water. Secondly, I should desire to answer Mr. Wright by saying that the Naval Officer, in my opinion, who ever has an idea of lowering his steam when he goes into action to evade any danger from that steam, is much more likely to incur the danger of having his whole ship sunk by a ram, or entirely put out of action by some other casualty of that kind. He had much better consider that he saves his steam as much as possible during the time he goes about the world in order to use it at its very highest power and pressure, no matter what may be the danger, when he does come into action. He might just as wisely drown half his magazine on going into action to avoid risk of being blown up, as lower half his steam to avoid being scalded by injury to his boiler. Existing forms of boiler are radically bad where high pressure is to be carried and will lead to disaster if not remodelled in accordance with the proper laws of strength and disposition of material: *tubulous*¹ boilers will not only afford an improvement in this direction, but also allow of repairs being effected without cutting the ship to pieces every time new boilers are required.

Mr. RENNIE: I do not know that I have very much to answer. It seems to me that the example Mr. Wright gave of the simple engine of that Atlantic vessel, and what Mr. Cowper mentioned, have pretty well answered Mr. Bramwell; and I should think if Mr. Bramwell made a very large single engine, he would come to the conclusion not to make another on that plan. What he says about the uniformity of motion in the American steamers is very true. Every one connected with engineering knows that the Americans have, as a rule, adopted the large single cylinder for propelling their vessels, and these vessels have very great speed, but we do not know whether if they used an engine with more uniform motion at the same power, they would not get a greater speed. I am inclined to think they would. I was glad to hear what Mr. Wright said about the weight. Mr. Wright said the engine being 10 per cent. heavier, taking the coal at 30 per cent. less, it practically reduces the advantage you get with compound engines to 20 per cent. But 20 per cent. is a very considerable amount; that is to say, you may steam six days instead of five days with the same amount of weight of engine and coal.

Mr. Cowper mentioned our having adopted his reservoir in the engines of the "Briton." I did not mention that in my paper, simply for this reason, that I sent Mr. Cowper an invitation to come here, and I thought he would explain it himself. As far as I have seen, that large reservoir had the advantage of keeping up an equal power in the two cylinders. That there was much advantage in the steam jacketing of that cylinder we were not so certain of, for in the "Thetis," a similar vessel, we first tried the engines with the reservoir; the reservoir was then entirely disconnected and we tried it with merely a connecting pipe between the two cylinders. The result was no material difference in the consumption of coal, but there was an advantage in having a greater uniformity of the power between the two cylinders.

Mr. Bramwell questioned my figure of six pounds per indicated horse-power for the high pressure engine, and he mentioned that some of the agricultural engines consumed as low as 2½ lbs. per indicated horse-power. [Mr. BRAMWELL: When on trial.] Those trials are so exceedingly deceptive, and if you go to a maker and ask him to make you a similar engine to that which was tried at 2½ lbs., and to guarantee you even 3 or 4 lbs. or 5 or 6 lbs., he will hardly do it.

Mr. BRAMWELL: Four, he would certainly, and if you wanted 3 they would have to provide you the engine-driver with the engine.

Mr. RENNIE: I am told even more. We have got a very good engine of that sort and we never get as far as we can make out anything like even 6 lbs., and I thought putting at 6 lbs. was within the mark.

Mr. BRAMWELL: I have a large locomotive practice to substantiate my tables,—engines in daily work on thousands of miles of railway.

Mr. RENNIE: At all events I put that figure down as regards the high pressure engines as used on board ships.

¹ *Tubulous*, not tubular. Tubulous boilers are those in which the water is contained in tubes and the fire circulates round them as distinguished from tubular, in which the fire passes through tubes surrounded by water.

The CHAIRMAN : I am sure I am only expressing the wish of the meeting in thanking Mr. Rennie for the paper he has brought before us. Our thanks are also due to those gentlemen who have taken part in the discussion. There has been a good deal of practical information given to us by the various gentlemen who have addressed the meeting.

DELINEATIONS OF SOME MINUTE SEA-SURFACE ANIMALS.—From Coloured Drawings by Mrs. TOYNBEE.

“The works of the Lord are great, sought out of all them that have pleasure therein.”

THE accompanying delineations of a number of minute natives of the ocean surface, as seen through a microscope, have been selected from a large number of coloured drawings¹ made during sea voyages by Mrs. Toynbee, who, at the request of Rear-Admiral Nolloth, permitted him to offer them to the Council for publication in the Journal. It is hoped that young Officers may be induced (like Navigating Lieutenant Palmer, who brought home most interesting sketches of the kind made on his way from China) to spend some portion of their leisure time at sea in procuring similar collections, the pleasure of the pursuit being enhanced by the prospect of adding to our scanty knowledge of this region of nature.

The means required are very simple and inexpensive :

A sufficiently powerful microscope can be bought for less than one pound.

A twine bag-net lined with white bunting should be towed day and night in calms when not under steam, and during daylight when the ship is at very slow speed : it may be hauled in at intervals of about a quarter of an hour, and washed in salt water, in a bucket painted white, with a black streak at the bottom, for the sake of greater conspicuousness of objects.

Specimens can be readily taken up for inspection and delineation under the microscope by means of a glass tube, one end of it being closed by the forefinger, and the other placed over the object in the bucket. On the finger being removed the individual is drawn into the tube, and easily dropped on to a piece of glass for examination.

The latitude and longitude, the temperature of the sea-surface, the current during the last 24 hours, the habits of the creatures—their modes of locomotion and of disporting themselves, &c., some of which are very interesting—should be noted.

If preservation of any remarkable specimens should be desired, the

¹ Eight plates will be issued with descriptive letter-press.—*Ed.*

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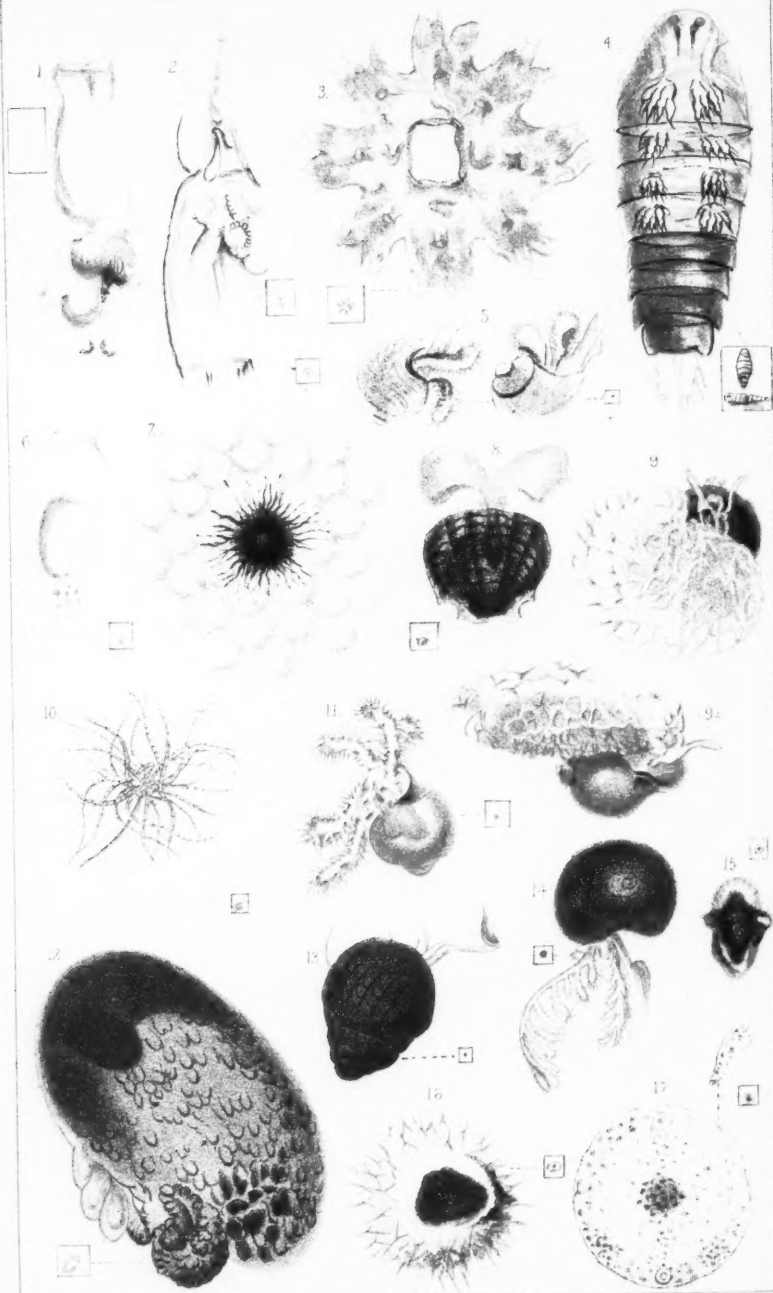
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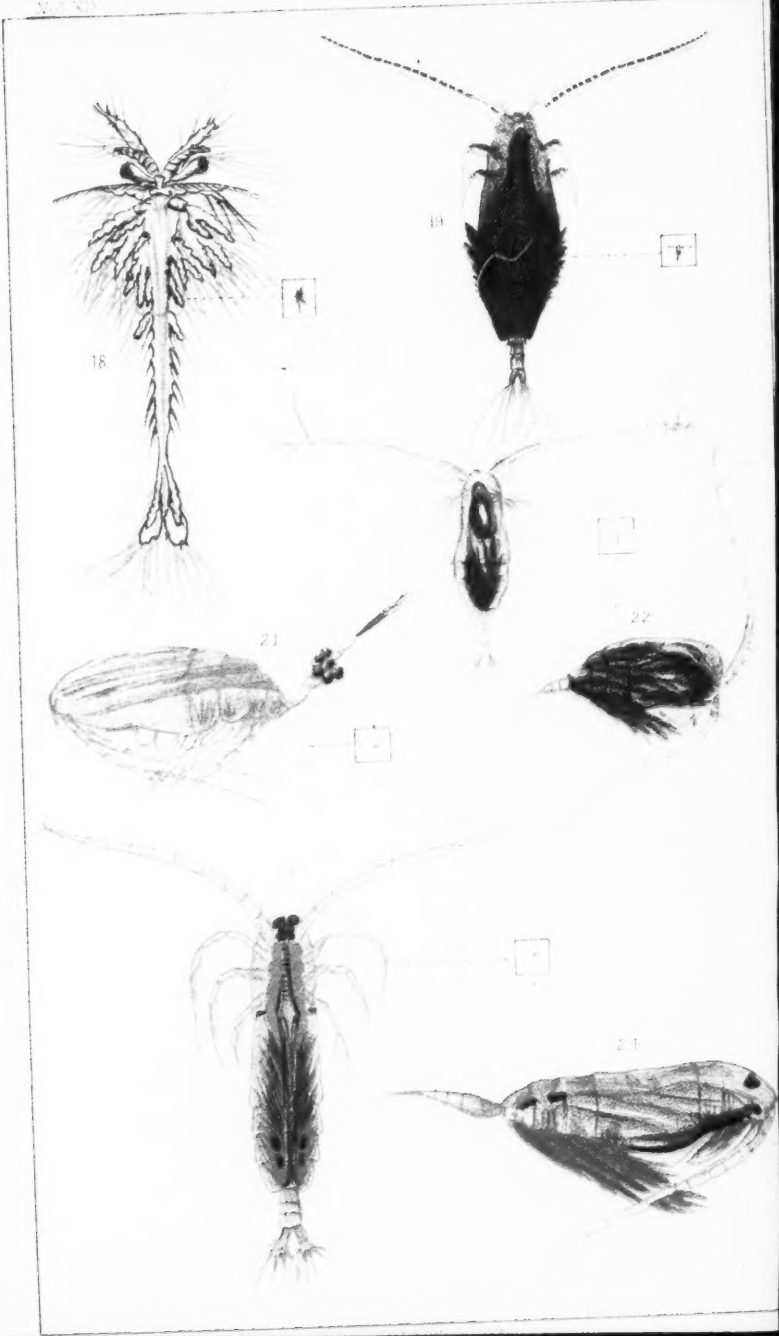
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little bottles of a homœopathic medicine-chest will be found useful,—the bottles containing spirits of wine, with one-third fresh water.

The names which precede the remarks on some of the figures have been pencilled on the original drawings by various Naturalists who have looked through them.

PLATE I.

- Fig. 1. March 27th, 1858. Lat., 0.04 N.; long., 82.24 E. Current in two days, N. 61 W., 57 miles. Found this delicate *Diphya*? in active motion, the lilac proboscis expanded and contracted.
- „ 2. *Diphyda*. *Eudoria*? one of the *Hydrozoa*.—May 20th, 1857. Lat., 30.00 N.; long., 45.13 W. Current, N. 78, W. 2 miles. Temperature of surface water, 71.1°. This specimen was found in the bucket drawn to ascertain the temperature. It was very active; motive power seemed to be in its lowest part, as the upper part was always kept foremost.
- „ 3. *Young Medusa*.—May 27th, 1857. Lat., 31.02½ N.; long., 45.06 W. Current, S. 14 W., 2 miles. Temperature of surface water, 73.3°. It was in constant motion, contracting and expanding its rays.
- „ 4. *Crustacea*. *Copepoda*. *Sapphirina coruscans*.—May 9th, 1857. Lat., 3.49 N.; long., 28.02 W. Current, N. 50 W., 30 miles. Temperature of surface water, 79°. Caught in the net; it was transparent, but as it turned in the water, it shone with the brightest prismatic colours. It was very active, and each time it turned the colours changed.
- „ 5. June 8th, 1858. Lat., 18.26 S.; long., 5.17 W. Current, N. 7 W., 6 miles. Temperature of surface water, 71.5°. Specific gravity, 1027.5. These shells were extremely abundant, the net being towed at night during a calm.
- „ 6. Oct. 5th, 1857. Lat., 12.06 N.; long., 26.49 W. Current, N. 49 W., 28 miles. Temperature of surface water, 80°. The transparent part looked glassy, the yellow, soft; below the yellow were bubbles in constant motion.
- „ 7. *Thalassicolla*.—May 9th, 1857. Lat., 3.49 N.; long., 28.02 W. Current, N. 50 W., 30 miles. Temperature of surface water, 79°. This remarkable formation had apparently no motion.
- „ 8. Feb. 4th, 1858. Lat., 17.11 N.; long., 83.24 E. Current, N. 64 E., 15 miles. Found several of these bivalve *Pteropods*? moving actively by means of their wings.
- „ 9. and 9a. *Ianthina*.—Dec. 1st, 1857. Lat., 34.34½ S.; long., 77.26½ E. Current, N. 44 E., 17 miles. Temperature of surface water, 67°. Found many shells of *Ianthina communis*, some without swimming floats were attached to the lower surface of *Vellicas*? In nearly all cases, they were accompanied by a small crab of the same colour as themselves.
- „ 9. Looking down on it; 9a, side view.
- „ 10. March 23rd, 1857. Lat., 26.53 S.; long., 58.14 E. Current in four days, N. 22 E., 41 miles. Temperature of surface water, 76°. Found this star without any apparent motion.
- „ 11. *Macgillivrayia* or *Cheletropis*.—July 8th, 1858. Lat., 29.39 N.; long., 42.14 W. Current, S. 18 W., 9 miles. Temperature of surface water, 77°.
- „ 12. Nov. 24th, 1857. Lat., 39.59 S.; long., 63.10 E. Current, N. 70 E., 21½ miles. Temperature of surface water, 58°. The purple protuberance of this object seemed, occasionally, to contract.
- „ 13. Dec. 17th, 1857. Lat., 8.12½ S.; long., 81.24 E. Current, S. 74 W., 39 miles. Temperature of surface water, 81°. This shell was opaque, but its inhabitant was clearly seen.
- „ 14. July 8th, 1858. Lat., 29.39 N.; long., 42.14 W. Current, S. 18 W., 9

216 DELINEATIONS OF SOME MINUTE SEA-SURFACE ANIMALS.

- miles. Temperature of surface water, 77°. This shell was caught in the net, though generally seen attached to the gulf weed. The tendrils were shot out suddenly at intervals, and worked rapidly while exposed.
- Fig. 15. *Mesatrochous larva of Annelid*.—April 9th, 1858. Lat., 12.48 S.; long., 74.30 E. Current, N. 24 W., 17 miles. Temperature of surface water, 81.2°. It was very active, darting about in the water, its ciliæ in rapid motion.
- „ 16. *Thalassicolla*.—Jan. 2nd. Lat., 11.17 N.; long., 81.45 E. Temperature of surface water, 78.3°. This appeared like a ball of transparent jelly, opaque in the centre, contained in a net of fibres, from which spikes protruded. No apparent motion.
- „ 17. *Probably allied to Planaria*.—May 9th, 1857. Lat., 3.49 N.; long., 28.02 W. Current, N. 50 W., 30 miles. Temperature of surface water, 79°. Many were found in the net. It appeared to be a circular disc, with globular centre; it moved by working the edges of the disc.

PLATE II.

- „ 18. *Larval Crustacean*.—May 22nd, 1857. Lat. 31.02½ N.; long., 45.06 W. Current, S. 14 W., 2 miles. Temperature of surface water, 73.3°. It worked its long front legs actively.
- „ 19. *Cyclops*.—Nov. 25th, 1856. Lat., 10.14 S.; long., 79.58 E. Temperature of surface water, 79.1°. Pumped up this crustacean. The hairs of the tail were like feathers, and very beautiful; it had the power of expanding and contracting them.
- „ 20 and 22. Nov. 28th, 1856. Lat., 3.25 S.; long., 82.30 E. Temperature of surface water, 79.8°. This is an example of the many variously and brilliantly coloured crustaceæ found in this position; their colours changed after being some time under the microscope, several of them ejected the colouring matter, which was probably their food. Fig. 22 is a side view of the crustacean represented in Fig. 20.
- „ 21. March 5th, 1857. Lat., 0.11 N.; long., 82.41 E. Temperature of surface water, 85°. Found this small blue crustacean, which had a few eggs on its tail, April 25th, 1857; lat., 19.25 S.; long., 0.59 W. Temperature of surface water, 70°. The bucket was alive with these crustaceæ, many of them with large bunches of eggs on their tails.
- „ 23 and 24. *Crustacea. Copepoda*. Nov. 28th, 1856. Lat., 3.25 S.; long., 82.32 E. Temperature of surface water, 80°. This crustacean kept up a circulation in the water by working its feet and tail.

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CAPTAIN H.R.H. THE DUKE OF CONNAUGHT, K.G., 7th Hussars.
FIELD-MARSHAL H.R.H. THE DUKE OF CAMBRIDGE, K.G., K.P., G.C.M.G., &c., &c.,
COMMANDING-IN-CHIEF.
MAJOR-GENERAL H.R.H. THE PRINCE CHRISTIAN OF SCHLESWIG-HOLSTEIN, K.G.
MAJOR-GENERAL H.S.H. THE PRINCE W.A.E. OF SAXE-WEIMAR, C.B.
H.S.H. THE DUKE OF TECK, G.C.B.

Disraeli, The Right Hon. Benjamin, M.P., First Lord of the Treasury.
Crosse, The Right Hon. Richard Assheton, M.P., Secretary of State for the Home Department.
Derby, The Right Hon. The Earl of, Secretary of State for Foreign Affairs.
Carnarvon, The Right Hon. The Earl of, Secretary of State for the Colonies.
Hardy, The Right Hon. Gathorne, M.P., Secretary of State for War.
Salisbury, The Most Hon. the Marquis of, Secretary of State for India.
Hunt, The Right Hon. G. Ward, M.P., First Lord of the Admiralty.

Northbrook, The Right Hon. Lord, Viceroy and Governor-General of India.
Abercorn, His Grace the Duke of, K.G., Lord Lieutenant of Ireland.
Peel, Lieut.-General The Right Hon. Jonathan.
Beresford, Right Hon. William.
Sartorius, Sir George Rose, K.C.B., Admiral of the Fleet.
Napier of Magdala, Lieut.-Gen. The Right Hon. Lord, G.C.B., G.C.S.I., &c.
Stewart, Sir Houston, G.C.B., Admiral of the Fleet.
Tweeddale, Field-Marshal The Most Hon. the Marquis of, K.T., G.C.B., &c., &c., &c.

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Hamilton, Sir Frederick W., K.C.B., Lieutenant-General.
Alcock, T. St. L., Col. Royal E. Middlesex Militia.
White, Lorraine, Major.
Fishbourne, E. G., C.B., Rear-Admiral.
Nicolson, Sir Frederick W. E., Bart., C.B., Vice-Admiral.

Collinson, Sir Richard, K.C.B., Vice-Admiral.
Codrington, Sir William J., G.C.B., General.
Hay, The Right Hon. Sir John C. D., Bart., C.B., M.P., D.C.L., F.R.S., Vice-Admiral.
Lacon, W. Stirling, Esq., late H.C.S.
Waveney, Col. the Right Hon. Lord, Commandant Suffolk Artillery Militia, A.D.C. to the Queen, F.R.S..

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VICE-CHAIRMAN—Nicolson, Sir Frederick W. Erskine, Bart., C.B., Vice-Admiral.

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Waugh, Sir Andrew S., Knight, Major-General, F.R.S.
Wilbraham, Sir Richard, Lieut.-General, K.C.B.
Maitland, Chas. L. B., Major-General.
Schomberg, G. A., C.B., R.M.A. Major General, Deputy Adjutant-General, Royal Marines.
Smythe, W. J., Maj.-Gen. R.A., F.R.S., M.R.I.A.
Elcho, Lord, M.P., Colonel Scottish Rifle Volunteers.
Green, Sir W. Henry Rodes, C.B., K.C.S.I., Major-General.
*Wilson, C. W., Maj. R.E., F.R.S., Director, Topographical Branch, War Office.
Higgins, W. F., Esq., late of the Colonial and War Offices.
Seymour, Lord William E., Lieut.-Col. Coldstream Guards.

Codrington, Sir Henry J., K.C.B., Admiral.
Tarleton, Sir J. Walter, K.C.B., Vice-Admiral.
Admiral-Superintendent of Naval Reserves.
Nolloth, M. S., Rear Admiral.
Thesiger, The Hon. Frederic, Colonel, C.B., A.D.C. to the Queen.
Aikman, F. R., J. C., Lt.-Col., Commandant Royal East Middlesex Militia, late Indian Army.
Tupper, A. C., Captain late K. Brecknock Rifle Militia.
Ommanney, Erasmus, Vice-Admiral, C.B., F.R.S.
Crossman, Lieut.-Col. R.E., Assistant Director of Works for Fortifications.
Gilford, The Right Hon. Lord, Captain R.N., Lord of the Admiralty.
Wilson, J. C., Captain R.N.
Willes G. O., Rear-Admiral, C.B.
Scott, R. A. E., Captain R.N.

* Nominated by the War Office.

SECRETARY AND CURATOR—Captain Boughy Burgess.

LIBRARIAN, ASSISTANT SECRETARY AND ACCOUNTANT—Thomas D. Sullivan, Esq., late Lieutenant.

CORRESPONDING MEMBERS OF COUNCIL:—

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 Rateman, B. S., Commr.
 Rowanquet, G. S., Capt.
 Bowden-Smith, N., Capt.
 Bower, Graham J., Lieut.
 Roys, Henry, Capt.
 Brent, Capt. H. W.
 Brooker, G. A. C., Capt.
 Bythesea, J. S. C., *U. S.*, Capt.
 Clanchy, H. F., Lieut., H.M.S.
 Jackal
 Codrington, W., Capt.
 Colomb, P. H., Capt., H.M.S.
 Audacious.
 Comber, H. W., Capt.
 Coote, R., Rear-Adml.
 Crofton, S. S. L., Capt.
 Cumming, W. H., Capt.
 Curtis, Seymour, Commr.
 De Horsey, A. F. R., Capt.
 De Robeck, H. St. J., Commr.

Durrant, F., Commr.
 Egerton, Hon. F., Rear-Admiral
 Egerton, F. W., Lieut.
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 Field, E., Capt.
 Fisher, J. A., Capt.
 Fitzclarence, Hon. G., Commander
 Fitzroy, R. O'B., Capt.
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 Gibbons, C., Commander
 Gilmore, A. H., Commander
 Grenfell, Hubert H., Lieut.
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 Harvey, J. W. F., Lieut.
 Hayes, J. M., Capt., C.B.
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 Triumph
 Inglis, C. D., Commr.
 Jones, O. J., Commodore
 Lambert, R. C.B., Rear-Admiral
 Liddell, W. H., Commr.

Martin, F., Captain
 Molyneux, W. H. M., Lieut. H.M.
 Ship Sirius
 Napier, G. J., Capt.
 Nicholson, H. F., Capt.
 Norcock, C. J., Lieut.
 Phillimore, A., Capt.
 Pike, J. W., Captain
 Prevost, J. C., Rear-Admiral
 Randolph, G. G., C.B., Rear-Admiral
 Sandys, H. S., Commr.
 Seymour, F. B. P., C.B., Rear-Admiral
 Shortland, P. F., Capt.
 Smith, S. S., Commr.
 Southey, L. J., F.R.G.S., Paym.
 Spencer, Hon. J. W. S., Rear-Adml.
 Spratt, T. A. B., C.B., Rear-Adml.
 Verney, Edmund Hope, Commr.
 Ward, Thos. Le H., Captain

ROYAL NAVAL RESERVE.

White, David, Lieut., late Indian Navy.

ROYAL NAVAL ARTILLERY VOLUNTEERS.

Ashley, Lord, late R.N. Lieutenant Commanding.

ROYAL MARINES.

Artillery.

Needham, J. L., Capt., Assistant to Professor of
 Fortification, R.N. College, Greenwich

Light Infantry.

Champion, P. R., Lieut.
 Farquharson, M. H., Lieut. and Adj.
 Frampton, Cyril, Lieut. and Adj.
 Sandwith, J. H., Lieut.

ARMY.

Williams, O.L.C., Col. R. H. Gds
 Molyneux, E., Capt. 7th Dr. Gds.
 Barton, B., Capt. 1 Battalion Cold-
 stream Gds.
 Philip, F. L., Capt. 2nd R. North
 British Drs.
 Moore, A. G. M., Col. 4th Hussars
 Carmichael, L. M., Capt. 5th Lhrs.
 Thesiger, Hon. C. W., Colonel 6th
 (Inniskilling) Dragoons
 Burnell, H. D. A.F., Lt.-Col. 7th
 Hussars
 Harnett, E., Major 11th Hussars
 Russell, J. C., Major 12th Lancers.
 Swindley, J. E., Lt.-Col. 15th Hus.
 Maillard, R. T., Capt. 16th Lancers
 Barrow, P. H. S., Captain 19th
 Hussars
 Montgomerie, A. W. J., Major
 20th Hussars
 Nesve, E. S., Lieut. 18th Beng. Cav.
 Desbrough, J., Col., C.B., B.A.
 Stirling, W., Lt.-Col. B.A.
 Vesey, G. H., Col. R.A.
 Wickham, E. B., Capt. R.A.
 Penrhorne, J. F., Lieut. R.A.
 Grant, W. J. E., C.B., Col. R.A.
 Chermide, H. L., Col., C.B., R.A.
 Hope, J. E., Lieut.-Col. R.A.
 Cockburn, C. F., Major R.A.
 Nicholson, F., Lieut. R.A.
 McMahon, C. J., Capt. R.A.
 Haggard, T. T., Col. R.A.
 Oldfield, R., Major R.A.
 Hutchinson, A. H., Major R.A.
 Wake, A. J., Major R.A.
 Moran, J. P., Major R.A.
 Stubbs, F. W., Major R.A.
 Knollys, H., Capt. R.A.
 Owen, C. H., Lieut.-Col. R.A.
 Milman, G. H. L., Col. R.A.
 Hime, H. W. L., Capt. R.A.
 De Butta, J. C. B., Col. R.A.
 Drake, J. M. C., Major R.E.
 Harrison, R., Major R.E.
 Innes, J. McLeod, *U. S.*, Lieut.-
 Col. R.E.
 Jones, Jenkin, Col. R.E.
 Smith, P. G. L., Major R.E.

Stotherd, R. H., Lt.-Col. R.E.
 Bowcroft, H. C., Lt. R.E.
 Woodward, C., Capt. R.E.
 Gun, H., Capt. R.E.
 Earle, W., Col. 1 Batt. Grenadier
 Guards
 Hinchbrook, Viscount, Lieut.-
 Col. 3 Batt. Gren. Gds.
 Trefusis, Hon. W. R., Lieutenant-
 Colonel 1 Battalion Scots Fusilier
 Guards
 Moncreiff, G. H., Lt.-Col. 1 Batt.
 Scots Fus. Gds.
 Fletcher, H. C., Col. 2nd Batt.
 Scots Fusilier Guards
 McGwire, E. T. St. L., Lt.-Col. 1st
 Batt. The Royal Scots
 Colley, G. Pomeroy, C.B., Lt.-Col.,
 2nd Batt. 2nd Queen's Royals
 Mackinnon, W. C., Capt. 1st Batt.
 3rd the Buffs
 Pearson, C. K., Lieut.-Col. 2 Batt.
 3rd the Buffs
 Cameron, W. G., C.B., Col. 1 Batt.
 4th King's Own
 Yorke, P. C., Lt., 2nd Batt. 4th
 King's Own
 Biggs, T. S., Major 1 Battalion 5th
 Fusiliers
 Ross, A. E., Major, 2nd Batt. 5th
 Fusiliers
 Cockburn, J. G., Capt. 1st Batt.
 6th Regt.
 Plummer, H., Major 1st Batt. 7th
 Royal Fusiliers
 Waller, G. H., Lt.-Col. 2 Batt. 7th
 Royal Fusiliers
 Daubeney, A. G., Major, 2 Batt.
 7th Royal Fusiliers
 Brown, C. B., Capt. 2nd Batt. 8th
 King's
 Bulger, G. E., Major 2nd Batt.
 10th Regt.
 Hare, E. H., Capt. 1 Battalion 11th
 Regiment
 Colville, C. F., Capt. 2d Batt. 11th
 Regt.
 Parr, H. H., Lieut. 1st Batt. 13th
 Light Inf.

Hawley, W. H., Lt.-Col. 1st Batt.
 14th Regt.
 Layard, C.E., Cap. 2 Batt. 15th Regt.
 Bancroft, W. C., Col. 2 Batt. 16th
 Regt.
 Tompson, W. D., Major 1 Batt. 17th
 Regt.
 Griffiths, E. St. J., Major 1st Batt.
 19th Regt.
 Knight, H. S. G. S., Major 2nd
 Batt. 19th Regt.
 Jackson, F. G., Capt. 1st Batt.
 21st R. N. B. Fus.
 Browne, Edm. C., Capt., 2nd Batt.,
 21st R. N. B. Fus.
 Panter, H. G., Lt.-Col. 2 Batt. 22nd
 Regt.
 Terry, F. S., Major 2nd Batt. 25th
 Regt.
 Hale, M. H., Major 26th Regt.
 Barton, E., Lieut., 27th Regt.
 Brodigan, J., Major 28th Regt.
 Spratt, E. J. H., Lieut. and Adj.
 29th Regt.
 Bateman, H. W., Capt. 31st Regt.
 Swiney, G. Clayton, Capt. 32nd
 Regt.
 Lloyd, T., Capt. 35th Regt.
 Ellea, W. K., Major 38th Regt.
 East, Cecil J., Bt., Major 41st Rt.
 Martin, G. W. T., Lt. 45th Regt.
 Lowry, R.W., C.B., Col. 47th Regt.
 Rawlins, J., Major 48th Regt.
 Lock, A. C. K., Lt.-Col. 50th Regt.
 Farrington, M. C., Major 51st Regt.
 Fife, A. G., Lieutenant 53rd Regt.
 Parker, F. G. S., Major 54th Regt.
 Barrow, Knapp, Capt. 57th Regt.
 Frampton, W. J., Capt. 58th Regt.
 Riddell, H. S., Hutton, Lt. 1st
 Battn. 60th Royal Rifles
 Chalmers, R., Capt. 2nd Batt. 60th
 Royal Rifles
 Murray, C. Wyndham, Lt. 61st
 Regt.
 Brown, H. B., Col. 63rd Regt.
 Barker, G. D., Lt.-Col. 64th Regt.
 Blewitt, C., Lt.-Col. 65th Regt.
 Ready, J. T., Capt. 66th Regt.

Corresponding Members—continued.

Lamprey, Jones, M.B., Surgeon-Major 67th Regt.
 Bagot, Gilbard, G., Col. 69th Regt.
 Gilbard, G. J., Capt. 71st Regt.
 Payn, W. C.B., Col. 72nd Regt.
 Cornish, C. O., Capt. 73rd Regt.
 Feilden, O. B., Major 78th Highlanders.
 Beazley, G. G., Capt. 83rd Regt.
 Wilson, W. H., Capt. 87th Regt.
 Wood, H. Evelyn, *U.C.*, C.B., Colonel 90th L.I.
 Kirk, J. B., Major 91st Highlanders
 Knollys, W. W., Major 93rd Highlanders, F.R.G.S.
 Malthus, S., Major 94th Regt.
 Petrie, M., Major h-p. 97th Regt.
 Dunne, J. H., Col. 98th Regt.
 Cook, H., Lt.-Col. 100th Regt.
 Hunter, S. A., Capt. 101st Roy. Beng. Fus.
 Rogers, J. E. V., Capt. 102nd Roy. Madras Fusiliers
 Thornton, E. Z., Capt. 104th Regt.
 Bell, H. J., Major 105th Madras Light Infantry.
 Garlick, J. W., Capt. 106th Bombay Light Inf.
 Fyers, W. A., C.B., Col., late Rif. Brig.
 Maclean, H. J., Lt.-Col. 3rd Batt. Rifle Brigade
 Wood, H., Major 4th Batt. Rifle Brigade.
 Mildmay, H. A. St. J., Capt. 3rd Batt. Rifle Brig.
 Brownrigg, H. S., 3rd Batt. Capt. Rifle Brigade
 Cole, W., Lt., 1st W. I. Regt.

Stoker, W. Beauchamp, Capt. 2nd W. I. Regt.
 Meaden, J., Major, late Ceylon Rifles.
 Halpin, R. C., Rev., M.A., Chaplain to the Forces, and to H.B.H. The Duke of Cambridge, K.G.
 Nason, J., Lieut.-Col. 3rd Brigade Depot
 Morgan, H., Major, Paym. 70th Brigade Depot.
 McDonald, A. M., Col. late 7th Depot Batt., Winchester
 Fonblanque, E. B. de, Dep. Controller, H.P.
 Jones, A. S., *U.C.*, Lt.-Col., late Adjutant Staff Coll., Sandhurst
 Cox, J. W., C.B., Col. on Staff, Jamaica
 Bolton, F. J., Major Unattached
 Poie, C. V. N., Lt.-Col. Unattached
 Davies, G. S., Major Unattached
 Stewart, W. L., Col. Unattached
 Yonge, G. N. A., Col. h-p., Q.M.G., Aldershot
 Layard, B. V., Capt. late 3d W. I. Regt.
 Walkey, R., Capt. R.A., Instructor of Artillery, Royal Mil. Academy
 Stoney, F. S., Capt. R.A., Assistant-Superintendent Royal Gun Factories, Woolwich
 Doorly, M., Maj., late 1st W. I. Regt.
 Strange, T. Bland, Lt.-Col. R.A., Special Duty, Canada
 Heathorn, T. B., Capt., late R.A.
 Macaulay, G. W., Lt.-Col., late Comd. 1st Scinde Horse

MacGregor, H. G., Capt. 29th Regt., Garrison Instr., Home District
 Robinson, C. W., Major Rifle Brig., Major of Brigade, Aldershot
 Fawcett, R. H., Captain 33rd Foot
 Garrison Instructor, Curragh
 Hale, L. A., Major R.E., S.M.E., Chatham
 Roe, Eugene M., Captain R. W. Fusiliers, Garrison Instructor, Dover and Shorncliffe
 Savile, A. H., Lt. 18th Royal Irish, Garrison Instructor, Malta
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 Rogers, E., Capt. Staff Officer of Pensioners, Chester, F.R.G.S.
 Wright, A. F., Bingham, Captain, A.D.C. to Brig. Gen. Comdg., Chatham
 Collen, E. H. H., Captain R.A., Officiating Assistant Sec. to the Govnt. of India, Military Dept.
 Willoughby-Osborne, Eric, Lt. h-p. Baker, V., Col. late 10th Hussars
 Robertson-Ross, P., C.B., Col. 9th Brig. Depot.
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 Goldsworthy, W. T., Lt.-Col., A.A.G. Cork.

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Baillie, J., Lieut.-Colonel Bengal Staff Corps
 Birch, W. B., Capt. Bengal Staff Corps
 Fosbery, G. V., *U.C.*, Major Bengal Staff Corps
 Sandeman, J. E., Capt. Bengal Staff Corps
 Gordon, J. J. H., Lt.-Col. Commandant 29th Bengal Native Infantry
 Mouat, F. J., Deputy-Inspector-Gen. Ben. Army, F.R.C.S.
 Lloyd, E., Lieutenant 4th Punjab Cavalry
 MacGregor, Lt.-Col. C. M., Assist. Quarter-Master-General, Army Head Quarters

Grant, J. M., Lt.-Col. Madras Staff Corps
 Bythell, R., Capt., Fort Adjutant, Asseerghur
 Ostrehan, E. S., Major Bom. Staff Corps
 Watts, J. G., Major Bombay Staff Corps
 Cologan, J. Fitzgerald, Captain Bengal S.C.
 Sewell, H. Fane H., Capt. Hyderabad Contingent
 Clutterbuck, T. St. Q., Capt. 29th Punjab Inf.
 Prenderkast, G. A., Major Comdt. 15th Bengal Cavalry
 Heyland, A., Rowley, Capt. 1st Bombay Lancers

MILITIA.

ENGLAND.

Vincent, C. E. H., Capt. Royal Berks, F.R.G.S.
 Breerton, Robert, Capt. and Adj. Royal Brecon
 White, C. H., Capt. and Adj. 1st Roy. Cheshire
 Hall, G., Lieut.-Col. Durham (Artillery)
 Tompson, H. Steuart, Capt. and Adj. N. Durham
 Digweed, W. H., Lt.-Col., late Hampshire
 Campbell, J. R., Major Hampshire (Artillery)
 Berthon, Alderson, Capt. Hants Isle of Wight (Arty.)
 Doughty, Chester, Capt. and Adj. Hereford
 Bailey, Vincent, Capt. Hereford
 White, C. W., Lt. West Kent Light Infantry.
 Wilson, C. T., Capt. Roy. Westminster, Middlesex
 German, J., Major late 3rd Roy. Lancashire
 Enfield, Viscount, Honorary Col. 2nd Roy. Rifles
 Sewell, T. D., Capt. Royal London
 Swan, J. P., Capt. Roy. Westminster, Middlesex
 Parker, C. W., Capt. and Adjutant 4th Roy. South Middlesex
 Northumberland, His Grace the Duke of, Lieut.-Col. Northumberland
 Adair, A. W., Lieut.-Col. Commdt. 2nd Somerset
 MacIver, D., late Capt. 2nd Somerset
 Evelyn, G. P., Lt.-Col. Commandant 1st Roy. Sur.
 Davis, John, Capt. 2nd Royal Surrey
 Flower, L., Capt. 3rd Roy. Surrey, 1. Musketry
 Gage, The Hon. H. E. H., Lieut.-Col. Royal Sussex
 Lee, J. W., Captain Queen's Own Light Infantry

Norris, G. G., Capt. 2nd Warwick
 Cockle, G. M.A., Cpt. Bl. Westmorland, 1. Musketry
 Fyera, H. T., Lieut.-Col. East and North York (Art.)
 Wade, H. C., C.B., Col. North York Rifles
 Raikes, G. A., Capt. 3rd West York
 Cadman, W. E., Major 5th West York
 Garmham, R. E., Major 6th West York.

SCOTLAND.

Hall, A. W., Capt. Royal Aberdeenshire Highldrs.
 Walker, G. G., Lt.-Col. Scottish Borderers
 Hardie, H. R., Capt. Haddington (Artillery)
 Halkett, J. C. C., Lt.-Col., Sirling
 Mackenzie, Colin, Capt. The Highland Rifle Militia

IRELAND.

Stawell, W. St. Leger Alcock, Lieut.-Cpl. North Cork (Rifles)
 Duncan, P., Major West Cork (Artillery)
 Forbes, Hon. W. F., Lt.-Col. Leitrim Rifles
 Gort, Viscount, Hon. Col. Limerick City (Artillery)
 Fox, L. Loftus B., Capt. Prince of Wales' Royal Longford Rifles
 Canfield, J. A., Lt.-Col. Royal Tyrone Fus.
 Cuffe, O. W., Capt. and Adj. Waterford (Artillery)
 CHANNEL ISLANDS.
 Le Conteur, Sir John, Kt., F.R.S., late Col. Royal Jersey. and A.D.C. to the Queen

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YEOMANRY CAVALRY.

Croft, R. B., Lieut. Herts, and Lieut. R.N.
Tottenham, C. J., Lt.-Col. Denbighshire
Mildmay, Sir H. B. P. St. John, Bart., Lieut.-Col.
Hampshire

Hamilton, J. G. C., Major Lanarkshire Q.O.
Portman, Hon. W. H. B., Col. West Somerset
Stanhope, W. T. S., Capt. 1st West York

HON. ARTILLERY COMPANY.

Field, J. W. P., Capt. I. Musketry

VOLUNTEER CORPS.

Artillery.

Butley, J. Lewis, Captain 2nd Middlesex
Innes, Alex., Major Aberdeen and Kincardine
Owen, R. G., Lieut. 3rd Essex
Pooley, H., Captain Cheshire
Haworth-Booth, B. B., Lieut.-Col. East Yorkshire

Engineers.

Kain, G. J., Capt. Middlesex
Bailey, W., Capt. and Adjutant 2nd Tower Hamlets

Rifles.

Acland, Sir Thomas Dyke, Bart., M.P., Lieut.-Col.
Devon
Davidson, D., Lieut.-Col. Edinburgh City
Twyford, H. B., Lieut.-Col. Hampshire
Hardinge, Viscount, Lieut.-Col. Kent
Higgins, F., Major, 6th Lancashire
Hutchinson, J., Hon. Col. 8th Lancashire

Tomkins, A. S., Capt. 1st Middlesex Victorias
Vickers, C. B., Lt.-Col. 2nd London
Milligan, C., Major and Adj., London Scottish
Page, Sam. Flood, Major late London Scottish
Lombard, G. C. S., Capt. and Adj. 21st Middlesex
Baker, James, Major 22nd (Queen's) Westminster
Roupell, C. M., Capt. 23rd Inns of Court
Enfield, Viscount, Honorary Col. 29th Nth. Midlex.
Baylis, T. H., Major 36th Middlesex
Skrine, Harcourt, Capt. 43rd Middlesex
Walker, A., Capt. and Adjt. Northumberland
Wright, C. J., Lieut.-Col. Nottingham
Thomas, W. H., Capt. 1st Surrey
Dartmouth, Earl of, Capt. Stafford
Rouse, Rolla, Major late 2nd Suffolk
Harding Charles, Major 19th Surrey, F.R.G.S.
Ratcliff, C., Lieut.-Col. 1st Warwickshire
Longstaff, Llewellyn W., Captain 1st East York

COLONIAL RESERVE FORCES.

Militia.

Gore, Augustus F., Lt.-Col., Barbadoes
Brunel, A., Lt.-Col., Active Militia, Canada
Imlack, B. W., Lt.-Col., British Guiana

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